



Figure 9. Location of surface-water stations in the Chehalis and Humptulips River Basins.

12020000 CHEHALIS RIVER NEAR DOTY, WA

LOCATION.--Lat 46°37'03", long 123°16'35", in NE¼NW¼, sec.14, T.13 N., R.5 W., Lewis County, Hydrologic Unit 17100103, on right bank 1.3 mi south of Doty, 1.6 mi upstream from Elk Creek, 3.4 mi north of Pe Ell, and at mile 101.8.

DRAINAGE AREA.--113 mi².

PERIOD OF RECORD.--October 1939 to current year.

REVISED RECORDS.--WSP 1316: 1943(M). WSP 1446: 1946(M). WDR-WA-72-1: 1945(M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 301.1 ft above NGVD of 1929 (river-profile survey). Prior to Oct. 1, 1961, nonrecording gage and crest-stage gage at site 50 ft upstream at datum 1 ft higher. Oct. 1, 1961, to Sept. 15, 1995, water-stage recorder at site 150 ft upstream at datum 1 ft higher. Prior to Feb. 24, 1999, at same site at datum 1 ft higher.

REMARKS.--Records fair. No regulation or diversion upstream from station. Chemical analyses July 1959 to September 1970, sediment records October 1961 to December 1964 (partial-record station).

AVERAGE DISCHARGE.--65 years (water years 1940-2004), 573 ft³/s, 68.95 in/yr, 415,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,900 ft³/s, Feb. 8, 1996, gage height, 20.37 ft, from rating curve extended above 8,000 ft³/s, on basis of slope-area measurement at gage height 18.36 ft; minimum discharge, 16 ft³/s, Aug. 31, Sept. 3, 4, 7, 8, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 21	0200	*8,270	*10.64	Jan 30	0530	6,870	9.58

Minimum discharge, 19 ft³/s, Oct. 1, gage height, 0.91 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	206	1,330	568	1,800	579	476	189	274	e70	39	107
2	22	208	1,040	521	1,660	522	424	174	218	68	36	96
3	22	186	1,100	473	1,430	511	383	164	182	74	38	86
4	23	168	913	420	1,150	573	e346	159	155	70	49	78
5	23	156	1,070	375	929	794	e320	160	144	67	55	73
6	24	143	2,210	353	871	1,000	e293	e146	219	e70	65	68
7	29	137	1,670	660	836	821	e278	e150	245	70	130	62
8	37	132	1,280	1,580	752	704	257	e164	210	67	78	58
9	93	127	1,030	1,990	664	e610	e242	e149	e171	75	59	e60
10	79	124	898	1,910	593	e524	e222	e145	e151	69	52	e60
11	67	239	763	1,590	531	e459	e213	e150	e158	68	45	359
12	407	218	882	1,340	475	e409	e203	e145	164	65	44	217
13	464	185	1,390	1,210	430	e373	e197	e131	253	61	42	232
14	205	165	2,040	1,280	485	e333	e262	e126	e252	50	43	320
15	126	175	1,890	1,410	874	e311	e310	e119	e207	48	39	496
16	820	624	1,590	1,200	1,020	e285	e279	e123	e179	47	37	515
17	2,910	1,150	1,470	945	1,010	e266	e261	e119	e158	45	38	618
18	970	4,340	1,170	831	966	e304	e237	e114	e141	45	38	592
19	594	4,640	979	777	908	e325	e281	e104	e126	43	43	725
20	2,660	2,390	861	708	813	e298	e417	e95	e117	43	43	504
21	5,000	1,490	716	615	729	e271	e625	e92	e110	43	47	363
22	1,640	1,030	624	540	635	e245	567	e94	e105	43	197	283
23	1,040	822	559	553	558	e229	448	e103	e103	41	122	237
24	718	951	713	602	538	345	370	e111	e102	39	105	199
25	543	1,630	1,180	645	e556	546	315	e87	e96	36	567	176
26	428	1,820	1,020	654	e535	858	293	e91	e89	36	661	152
27	355	1,420	981	714	e545	1,470	269	e140	e84	35	383	133
28	322	1,670	907	1,130	575	e1,080	244	e296	e80	36	251	122
29	311	3,330	816	3,400	575	e817	221	e282	e77	34	186	114
30	270	1,960	696	5,280	---	e664	203	315	e73	35	147	105
31	227	---	627	2,570	---	547	---	344	---	36	123	---
TOTAL	20,451	31,836	34,415	36,844	23,443	17,073	9,456	4,781	4,643	1,629	3,802	7,210
MEAN	660	1,061	1,110	1,189	808	551	315	154	155	52.5	123	240
MAX	5,000	4,640	2,210	5,280	1,800	1,470	625	344	274	75	661	725
MIN	22	124	559	353	430	229	197	87	73	34	36	58
AC-FT	40,560	63,150	68,260	73,080	46,500	33,860	18,760	9,480	9,210	3,230	7,540	14,300
CFSM	5.84	9.39	9.82	10.5	7.15	4.87	2.79	1.36	1.37	0.47	1.09	2.13
IN.	6.73	10.48	11.33	12.13	7.72	5.62	3.11	1.57	1.53	0.54	1.25	2.37

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2004, BY WATER YEAR (WY)

MEAN	277	911	1,262	1,228	1,160	893	572	272	145	70.2	47.0	78.5
MAX	1,121	2,131	2,486	2,888	2,940	1,870	1,285	700	390	183	124	357
(WY)	(1998)	(1956)	(1995)	(1953)	(1999)	(1956)	(1996)	(1948)	(1968)	(1983)	(1968)	(1959)
MIN	20.5	57.6	217	176	278	216	207	125	62.8	33.9	23.3	22.0
(WY)	(1988)	(1994)	(1977)	(1977)	(1993)	(1992)	(1941)	(1994)	(1992)	(1951)	(2003)	(1998)

12020000 CHEHALIS RIVER NEAR DOTY, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1940 - 2004	
ANNUAL TOTAL	237,169		195,583		573	
ANNUAL MEAN	650		534		911	
HIGHEST ANNUAL MEAN					1956	
LOWEST ANNUAL MEAN					2001	
HIGHEST DAILY MEAN	6,590	Jan 31	5,280	Jan 30	19,200	Feb 8, 1996
LOWEST DAILY MEAN	19	Sep 28	22	Oct 1	16	Sep 3, 1992
ANNUAL SEVEN-DAY MINIMUM	20	Sep 24	24	Oct 1	17	Aug 29, 1992
ANNUAL RUNOFF (AC-FT)	470,400		387,900		415,500	
ANNUAL RUNOFF (CFSM)	5.75		4.73		5.08	
ANNUAL RUNOFF (INCHES)	78.08		64.39		68.95	
10 PERCENT EXCEEDS	1,650		1,280		1,460	
50 PERCENT EXCEEDS	317		276		259	
90 PERCENT EXCEEDS	24		46		36	

e Estimated

12020800 SOUTH FORK CHEHALIS RIVER NEAR WILDWOOD, WA

LOCATION.--Lat 46°26'42", long 123°04'57", in NW ¼ NE ¼ sec.17, T.11 N., R.3 W., Lewis County, Hydrologic Unit 17100103, on left bank at Wildwood Road bridge, 0.4 mi downstream from Black Creek, 1.2 mi southeast of Wildwood, and at mile 16.2.

DRAINAGE AREA.--27.0 mi².

PERIOD OF RECORD.--October 1998 to current year (seasonal records).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is NGVD of 1929 (levels by Lewis County).

REMARKS.--Records good except for estimated daily discharges, which are fair, and flows below 10 ft³/s, which are poor. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,370 ft³/s Nov. 25, 1998, elevation, 361.44 ft, from floodmarks; minimum discharge, 4.5 ft³/s, Oct. 17, 18, 19, 2002.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 8, 1996, reached a stage of 363.57 ft from floodmarks, discharge, 5,620 ft³/s, from rating curve extended above 2,600 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,720 ft³/s, Jan. 30, gage height, 357.02 ft; minimum discharge, 4.8 ft³/s, Oct. 4, gage height, 352.38 ft, but may have been lower Oct. 1-3.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR
1	e5.1	34	294	128	438	93	93
2	e5.2	35	227	115	364	84	84
3	e5.2	33	210	107	292	85	78
4	5.3	31	176	97	241	90	72
5	5.7	30	192	88	201	137	68
6	6.1	29	342	90	191	165	64
7	12	28	265	109	167	141	61
8	14	28	213	209	144	126	58
9	31	27	181	251	129	113	55
10	18	27	173	290	117	102	53
11	15	44	153	274	107	93	51
12	90	37	209	248	99	86	50
13	68	33	340	236	92	80	49
14	35	31	480	254	102	75	55
15	32	34	441	281	121	70	55
16	140	118	348	243	131	66	54
17	162	188	300	203	135	63	49
18	78	1,040	245	184	137	68	47
19	57	870	206	172	e130	75	51
20	208	490	181	152	121	65	69
21	467	328	152	133	112	61	109
22	181	233	132	121	102	58	86
23	118	188	119	133	94	56	70
24	84	214	173	139	93	75	63
25	67	387	237	143	94	104	58
26	56	399	196	144	94	158	54
27	49	305	199	144	107	265	51
28	45	376	200	270	98	190	48
29	44	706	179	942	92	149	46
30	40	417	153	1,230	---	125	44
31	36	---	139	622	---	107	---
TOTAL	2,179.6	6,740	7,055	7,752	4,345	3,225	1,845
MEAN	70.3	225	228	250	150	104	61.5
MAX	467	1,040	480	1,230	438	265	109
MIN	5.1	27	119	88	92	56	44
AC-FT	4,320	13,370	13,990	15,380	8,620	6,400	3,660
CFSM	2.60	8.32	8.43	9.26	5.55	3.85	2.28
IN.	3.00	9.29	9.72	10.68	5.99	4.44	2.54

e Estimated

12021800 CHEHALIS RIVER NEAR ADNA, WA

LOCATION.--Lat 46°37'33", long 123°06'02", in NE ¼ SE ¼ sec.7, T.13 W., R.3 W., Lewis County, Hydrologic Unit 17100103, on right bank at railroad bridge, 2.0 mi downstream from South Fork Chehalis River, 2.0 mi west of Adna, and at mile 86.0.

DRAINAGE AREA.--340 mi².

PERIOD OF RECORD.--October 1998, to current year (seasonal records).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is NGVD of 1929 (levels by Lewis County).

REMARKS.--Elevation record only. Probably some diversion upstream for irrigation and domestic use. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 206.66 ft Dec. 17, 2001.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 8, 1996, reached an elevation of 213.14 ft from floodmark at site.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 200.62 ft, Jan. 30; minimum elevation, 190.42 ft, Nov. 10, but may have been lower Oct 1-21.

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR
1	---	190.71	193.45	191.79	195.10	191.49	191.33
2	---	190.71	192.77	191.62	194.56	191.36	191.18
3	---	190.70	192.85	191.49	193.98	191.33	191.08
4	---	190.62	192.46	191.37	193.30	191.47	190.99
5	---	190.58	192.64	191.21	192.75	191.76	190.91
6	---	190.53	194.73	191.20	192.49	192.47	190.84
7	---	190.50	194.05	191.73	192.37	192.15	190.78
8	---	190.49	193.24	193.58	192.09	191.88	190.74
9	---	190.46	192.70	194.46	191.85	191.65	190.68
10	---	190.43	192.49	194.40	191.67	191.45	190.63
11	---	190.68	192.25	193.92	191.52	191.31	190.59
12	---	190.75	192.34	193.39	191.39	191.20	190.55
13	---	190.62	193.05	193.05	191.28	191.10	190.53
14	---	190.56	194.82	192.95	191.32	191.02	190.58
15	---	190.53	194.88	193.06	192.00	190.94	190.74
16	---	191.01	194.01	192.76	192.44	190.88	190.69
17	---	192.65	193.67	192.31	192.51	190.83	190.66
18	---	196.21	193.05	192.08	192.45	190.85	190.59
19	---	198.19	192.59	191.94	192.36	190.99	190.63
20	---	195.90	192.25	191.78	192.13	190.89	190.88
21	---	194.17	191.94	191.59	191.90	190.81	191.28
22	193.84	193.08	191.69	191.44	191.69	190.75	191.32
23	192.68	192.46	191.52	191.55	191.49	190.71	191.04
24	191.96	192.66	191.74	191.79	191.40	190.88	190.88
25	191.55	193.83	192.96	192.12	191.49	191.35	190.75
26	191.28	194.70	192.65	192.01	191.53	192.11	190.67
27	191.10	193.83	192.49	192.02	191.50	193.56	190.59
28	190.99	193.52	192.76	192.52	191.54	192.95	190.54
29	191.03	196.41	192.58	196.22	191.45	192.29	190.49
30	190.92	194.62	192.20	199.65	---	191.85	190.45
31	190.79	---	191.96	196.73	---	191.55	---
MEAN	191.61	192.40	192.86	192.83	192.19	191.48	190.79
MAX	193.84	198.19	194.88	199.65	195.10	193.56	191.33
MIN	190.79	190.43	191.52	191.20	191.28	190.71	190.45

12024000 SOUTH FORK NEWAUKUM RIVER NEAR ONALASKA, WA

LOCATION.--Lat 46°34'33", long 122°41'02", on south line of SE $\frac{1}{4}$, sec.28, T.13 N., R.1 E., Lewis County, Hydrologic Unit 17100103, on right bank at Jorgenson Road bridge, 1 mi upstream from Lost Creek, 1.7 mi east of Onalaska, and at mile 22.8.

DRAINAGE AREA.--42.4 mi².

PERIOD OF RECORD.--July to October 1942, July to October 1943, July 1944 to November 1948, June 1957 to September 1971, October 1943 to September 1958, published as Newaukum River near Onalaska, and October 1998, to current year (seasonal records).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is NGVD of 1929 (levels by Lewis County). Prior to October 1998 at same site at different datum. Prior to September 28, 1944, nonrecording gage at same site at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Probably some small diversions for irrigation and domestic use upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--18 years (water years 1944-48, 1957-71) 200 ft³/s, 64.06 in/yr, 144,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,810 ft³/s, Dec. 11, 1946, gage height, 8.40 ft, datum then in use; minimum discharge, 8.9 ft³/s, Oct. 1-4, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,750 ft³/s, Jan. 29, gage height, 535.54 ft; minimum discharge, 8.9 ft³/s, Oct. 1-4, gage height, 529.60 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO APRIL 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR
1	e9.5	56	468	179	746	191	135
2	9.5	60	388	167	613	172	125
3	9.6	57	461	159	498	188	119
4	9.4	51	350	145	478	288	110
5	10	47	411	131	402	323	106
6	11	44	429	137	379	324	101
7	26	42	362	294	358	283	97
8	26	42	304	482	316	253	93
9	79	40	261	609	284	231	89
10	64	47	261	747	256	204	87
11	43	294	244	601	235	185	83
12	169	172	315	484	215	170	80
13	185	124	561	434	201	156	78
14	88	100	723	499	229	148	88
15	69	98	e620	621	207	138	96
16	136	149	e480	524	244	131	91
17	104	289	417	392	263	124	91
18	72	545	349	355	276	138	85
19	59	703	308	328	297	146	88
20	122	530	358	e285	263	127	120
21	401	357	351	e250	233	119	135
22	203	250	299	227	208	113	121
23	165	214	263	459	189	110	110
24	125	281	261	589	178	137	100
25	100	463	322	471	170	159	91
26	83	487	276	416	174	187	86
27	71	369	272	371	237	228	80
28	75	414	282	678	227	207	76
29	81	970	250	2,190	209	180	73
30	72	653	213	1,600	---	165	70
31	61	---	198	969	---	150	---
TOTAL	2,738.0	7,948	11,057	15,793	8,585	5,675	2,904
MEAN	88.3	265	357	509	296	183	96.8
MAX	401	970	723	2,190	746	324	135
MIN	9.4	40	198	131	170	110	70
AC-FT	5,430	15,760	21,930	31,330	17,030	11,260	5,760
CFSM	2.08	6.25	8.41	12.0	6.98	4.32	2.28
IN.	2.40	6.97	9.70	13.86	7.53	4.98	2.55

e Estimated

12024400 NORTH FORK NEWAUKUM RIVER NEAR FOREST, WA

LOCATION.--Lat 46°40'03", long 122°46'08", in NW ¼ SE ¼ sec.26, T.14 N., R.1 W., Lewis County, Hydrologic Unit 17100103, on right bank 0.5 mi upstream from Bear Creek, at North Fork Road bridge, 6.3 mi northeast of Forest, and at mile 7.7.

DRAINAGE AREA.--29.6 mi².

PERIOD OF RECORD.--October 1998 to current year (seasonal records).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is NGVD of 1929 (levels by Lewis County).

REMARKS.--Records fair except estimated daily discharges which are poor. Probably some small diversions for irrigation and domestic use upstream from station. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,090 ft³/s Dec. 15, 1999, elevation 406.44 ft; minimum daily discharge 6.6 ft³/s, Oct. 1, 2, 4, 2003, but may have been less during the period Oct. 1-7, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 1,580 ft³/s Jan. 29, elevation 404.76 ft; minimum daily discharge 6.6 ft³/s, Oct. 1, 2, 4, but may have been less during the period Oct. 1-7.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR
1	e6.6	32	217	106	452	96	62
2	e6.6	36	177	96	382	80	59
3	e7.2	39	206	91	318	91	57
4	e6.6	38	171	81	294	138	54
5	e7.2	32	206	72	249	148	52
6	e8.0	29	224	81	227	150	48
7	e17	29	182	223	209	132	46
8	17	27	150	371	181	115	45
9	41	26	125	371	177	100	42
10	26	29	145	389	155	87	40
11	17	128	138	313	133	81	41
12	94	63	185	249	124	75	40
13	75	49	292	216	115	70	42
14	32	43	403	215	125	64	44
15	27	57	347	235	110	61	44
16	62	118	264	216	138	61	44
17	40	172	234	183	151	59	43
18	28	314	197	177	157	72	39
19	26	682	172	167	163	81	40
20	141	416	182	151	142	66	52
21	365	260	164	134	125	60	56
22	132	181	147	122	111	58	51
23	103	147	134	223	101	56	48
24	72	199	142	299	98	69	44
25	54	328	216	235	92	85	41
26	44	319	168	211	95	113	38
27	41	240	170	194	131	117	37
28	42	285	192	314	118	95	36
29	46	528	161	1,160	108	89	35
30	40	330	129	996	---	83	35
31	35	---	117	584	---	72	---
TOTAL	1,659.2	5,176	5,957	8,475	4,981	2,724	1,355
MEAN	53.5	173	192	273	172	87.9	45.2
MAX	365	682	403	1,160	452	150	62
MIN	6.6	26	117	72	92	56	35
AC-FT	3,290	10,270	11,820	16,810	9,880	5,400	2,690

e Estimated

CHEHALIS RIVER BASIN

12025000 NEWAUKUM RIVER NEAR CHEHALIS, WA

LOCATION.--Lat 46°37'13", long 122°56'38", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.9, T.13 N., R.2 W., Lewis County, Hydrologic Unit 17100103, on left bank at highway bridge, 3.0 mi southeast of Chehalis, and at mile 4.1.

DRAINAGE AREA.--155 mi².

PERIOD OF RECORD.--March 1929 to September 1931, July 1942 to September 1981, October 1982 to current year.

REVISED RECORDS.--WSP 1012: 1943. WSP 1316: 1929-30(M), 1960(M). WSP 1716: Drainage area. WSP 1932: 1931(M), 1945-49, 1954(M), 1956(P), 1958(M), 1959-60.

GAGE.--Water-stage recorder. Elevation of gage is 190 ft above NGVD of 1929, from topographic map. Prior to Oct. 1, 1929, nonrecording gage at same site at datum 1.0 ft higher. Oct. 1, 1929, to July 5, 1962, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records good, except for estimated daily discharges, which are fair. Cities of Chehalis and Centralia divert about 3 ft³/s from North Fork Newaukum River for municipal use. No regulation. Some diversion for irrigation upstream from station during summer months.

AVERAGE DISCHARGE.--63 years (water years, 1930-31, 1943-81, 1983-2004), 502 ft³/s, 43.96 in/yr, 363,300 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft³/s, Feb. 8, 1996, gage height, 13.54 ft, from outside high-water mark; maximum gage height, 13.62 ft, Dec. 9, 1953; minimum discharge, 12 ft³/s, Sept. 13, 14, 1949, Aug. 29, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov 19	1300	4,070	8.20	Jan 30	0000	*7,460	*11.12

Minimum discharge, 31 ft³/s, Oct. 1-5.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e33	125	e1,700	616	2,470	561	314	131	497	91	41	131
2	31	127	e1,600	568	1,950	485	286	125	371	90	39	134
3	31	134	e2,000	567	1,510	496	269	122	299	91	39	123
4	31	121	e1,500	533	1,310	680	254	121	251	88	42	108
5	32	113	e1,700	449	1,100	777	240	142	232	83	44	99
6	33	106	e2,000	434	970	869	228	124	269	80	47	92
7	51	101	e1,500	884	929	738	217	124	303	80	94	86
8	62	99	e1,200	1,640	803	639	208	143	257	77	81	82
9	125	97	e1,000	2,060	713	569	199	136	225	74	54	87
10	145	95	e870	2,250	643	501	190	120	225	74	45	89
11	104	363	e740	1,870	587	451	183	127	223	79	41	241
12	181	355	890	1,390	537	412	174	130	202	72	39	212
13	394	253	1,410	1,150	495	379	172	117	247	66	37	217
14	201	207	2,720	1,140	556	353	181	110	266	64	36	384
15	137	189	2,270	1,410	549	330	204	105	229	61	36	674
16	207	327	1,480	1,240	594	310	193	108	202	60	36	926
17	223	648	1,210	962	810	292	204	104	182	58	35	612
18	154	1,230	964	933	792	309	182	99	165	57	33	739
19	124	2,950	818	936	850	381	180	94	153	55	34	847
20	161	2,480	849	814	740	328	238	91	142	54	33	649
21	1,130	1,580	836	703	647	293	280	88	133	53	36	461
22	559	942	734	623	569	273	266	94	126	50	217	364
23	390	709	656	1,260	509	261	228	171	128	47	146	312
24	296	e800	688	2,080	467	289	211	129	125	45	110	273
25	230	e860	1,080	1,560	454	354	189	108	120	43	661	243
26	188	e900	907	1,210	476	519	174	151	113	43	700	219
27	162	e880	921	1,040	613	574	163	344	106	43	667	200
28	145	e1,000	1,190	1,340	674	515	155	769	101	42	341	185
29	172	e3,300	956	5,550	609	439	145	750	97	41	234	173
30	155	e2,200	746	6,170	---	384	138	612	94	40	180	165
31	138	---	658	3,310	---	352	---	683	---	43	150	---
TOTAL	6,025	23,291	37,793	46,692	23,926	14,113	6,265	6,272	6,083	1,944	4,328	9,127
MEAN	194	776	1,219	1,506	825	455	209	202	203	62.7	140	304
MAX	1,130	3,300	2,720	6,170	2,470	869	314	769	497	91	700	926
MIN	31	95	656	434	454	261	138	88	94	40	33	82
AC-FT	11,950	46,200	74,960	92,610	47,460	27,990	12,430	12,440	12,070	3,860	8,580	18,100
CFSM	1.25	5.01	7.87	9.72	5.32	2.94	1.35	1.31	1.31	0.40	0.90	1.96
IN.	1.45	5.59	9.07	11.21	5.74	3.39	1.50	1.51	1.46	0.47	1.04	2.19

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2004, BY WATER YEAR (WY)

MEAN	180	731	1,061	1,087	984	769	539	294	183	89.7	55.9	71.8
MAX	646	1,717	2,244	2,169	1,940	1,609	1,052	680	464	307	159	304
(WY)	(1998)	(1956)	(1997)	(1953)	(1999)	(1972)	(1991)	(1960)	(1981)	(1983)	(1968)	(2004)
MIN	25.5	47.6	194	192	262	280	209	130	66.3	36.1	21.6	27.9
(WY)	(1988)	(1930)	(1977)	(1977)	(1977)	(1992)	(2004)	(1947)	(1992)	(1951)	(1951)	(1987)

12025000 NEWAUKUM RIVER NEAR CHEHALIS, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1930 - 2004	
ANNUAL TOTAL	198,283		185,859			
ANNUAL MEAN	543		508		502	
HIGHEST ANNUAL MEAN					795	
LOWEST ANNUAL MEAN					244	
HIGHEST DAILY MEAN	6,490	Jan 31	6,170	Jan 30	10,200	Feb 8, 1996
LOWEST DAILY MEAN	22	Sep 5	31	Oct 2	14	Sep 13, 1949
ANNUAL SEVEN-DAY MINIMUM	24	Aug 31	35	Oct 1	15	Aug 20, 1951
ANNUAL RUNOFF (AC-FT)	393,300		368,700		363,300	
ANNUAL RUNOFF (CFSM)	3.50		3.28		3.24	
ANNUAL RUNOFF (INCHES)	47.59		44.61		43.96	
10 PERCENT EXCEEDS	1,260		1,210		1,220	
50 PERCENT EXCEEDS	299		239		260	
90 PERCENT EXCEEDS	34		54		45	

e Estimated

CHEHALIS RIVER BASIN

12025100 CHEHALIS RIVER AT WASTEWATER TREATMENT PLANT, AT CHEHALIS, WA

LOCATION.--Lat 46°39'40", long 122°58'58", in NE $\frac{1}{4}$ NW $\frac{1}{4}$, sec.31, T.14 N., R.2 W., Lewis County, Hydrologic Unit 17100103, on right bank at City of Chehalis wastewater treatment plant, 0.25 mi downstream from State Highway 6 bridge, and at mile 74.3.

DRAINAGE AREA.--618 mi².

PERIOD OF RECORD.--Water years 1999, 2000 (annual maximum). October 2000 to current year (seasonal records).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is NGVD of 1929 (levels by Lewis County).

REMARKS.--Elevation record only. Probably some diversion upstream for irrigation and domestic use. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Peak of Nov. 26, 1998, reached an elevation of 177.61 ft from floodmarks at site.

EXTREMES FOR CURRENT YEAR.--Maximum elevation occurred during period of missing record; minimum elevation, 147.98 ft, Oct. 3.

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2003 TO APRIL 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR
1	---	---	---	---	---	153.34	---
2	---	---	---	---	---	152.98	---
3	---	---	---	---	---	152.73	---
4	148.04	---	---	---	---	153.37	---
5	148.05	---	---	---	---	154.03	---
6	148.05	---	---	---	---	155.77	---
7	148.13	---	---	---	---	155.21	---
8	148.29	---	---	---	---	154.49	150.63
9	148.54	---	---	---	---	153.84	150.48
10	149.15	---	---	---	---	153.22	150.33
11	149.02	---	---	---	---	152.73	150.21
12	149.12	---	---	---	---	152.36	150.10
13	151.59	---	---	---	---	152.01	150.03
14	150.59	---	---	---	---	151.72	150.08
15	149.57	---	---	---	---	151.47	150.57
16	149.77	---	---	---	---	---	150.52
17	156.20	---	---	---	---	---	150.55
18	154.70	---	---	---	---	---	150.37
19	151.65	---	---	---	---	---	150.30
20	152.05	---	---	---	155.31	---	150.89
21	163.86	---	---	---	154.65	---	151.76
22	159.31	---	---	---	154.02	---	152.23
23	155.04	---	---	---	153.43	---	151.54
24	153.25	---	---	---	152.99	---	151.10
25	152.10	---	---	---	153.06	---	150.75
26	151.30	---	---	---	153.33	---	150.49
27	150.78	---	---	---	153.40	---	150.23
28	150.44	---	---	---	153.72	---	150.07
29	150.50	---	---	---	153.43	---	149.92
30	150.32	---	---	---	---	---	149.79
31	---	---	---	---	---	---	---
MEAN	---	---	---	---	---	---	---
MAX	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---

12025700 SKOOKUMCHUCK RIVER NEAR VAIL, WA

LOCATION.--Lat 46°46'22", long 122°35'34", in SW¹/₄NW¹/₄, sec.20, T.15 N., R.2 E., Thurston County, Hydrologic Unit 17100103, on right bank about 150 ft downstream from logging bridge, 0.4 mi downstream from Hospital Creek, 5.8 mi southeast of Vail, and at mile 28.8.

DRAINAGE AREA.--40.0 mi².

PERIOD OF RECORD.--October 1967 to current year.

REVISED RECORDS.--WDR WA-75-1: 1974.

GAGE.--Water-stage recorder. Elevation of gage is 710 ft above NGVD of 1929, from topographic map.

REMARKS.--Records fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--37 years (water years 1968-2004), 200 ft³/s, 68.04 in/yr, 145,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,350 ft³/s, Feb. 8, 1996, gage height, 11.24 ft; minimum discharge, 13 ft³/s, Oct. 29, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,250 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 21	0330	1,420	6.31	Jan 29	1700	*2,430	*7.21
Nov 19	0530	2,250	7.06				

Minimum discharge, 17 ft³/s, all or part of each day Oct. 1-6, gage height, 2.99 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	78	454	161	669	176	155	70	201	51	27	73
2	17	76	411	147	529	160	141	67	160	50	27	69
3	17	71	543	e137	429	157	131	65	136	50	27	63
4	17	67	397	e126	385	193	122	72	118	48	27	58
5	17	63	605	e119	326	259	114	69	115	46	27	55
6	18	60	735	131	344	295	108	63	132	45	39	52
7	31	59	510	393	352	262	102	66	126	45	52	50
8	47	58	370	786	302	242	98	68	114	43	32	49
9	85	56	293	780	258	214	94	65	107	43	29	51
10	65	65	260	944	225	186	90	62	105	43	27	47
11	48	202	234	649	201	167	87	64	99	42	26	157
12	267	136	350	480	183	152	85	60	93	40	26	94
13	226	113	605	417	170	140	82	57	129	38	25	154
14	110	98	718	441	196	131	94	56	121	37	24	183
15	96	109	546	582	189	123	92	54	111	37	24	337
16	212	278	474	501	238	116	88	54	102	36	24	288
17	156	522	485	368	294	111	87	52	95	35	24	246
18	107	1,220	393	309	311	125	82	50	87	35	23	316
19	90	1,630	337	276	314	129	89	49	81	34	23	351
20	399	829	407	239	266	118	129	49	76	34	23	249
21	961	488	372	209	224	114	141	48	72	33	26	190
22	403	326	307	189	194	110	127	60	70	32	107	160
23	303	277	260	245	174	107	114	74	69	31	43	139
24	212	340	285	308	164	142	103	58	67	30	79	123
25	164	457	350	279	157	193	95	54	64	29	396	111
26	135	421	296	263	163	287	88	87	60	29	272	102
27	115	319	272	243	230	375	84	131	58	29	197	95
28	109	424	252	484	212	307	80	310	56	28	137	89
29	104	961	220	1,840	193	237	76	267	54	28	107	85
30	94	637	192	1,780	---	202	73	271	52	28	90	81
31	84	---	176	986	---	175	---	268	---	28	79	---
TOTAL	4,726	10,440	12,109	14,812	7,892	5,705	3,051	2,840	2,930	1,157	2,089	4,117
MEAN	152	348	391	478	272	184	102	91.6	97.7	37.3	67.4	137
MAX	961	1,630	735	1,840	669	375	155	310	201	51	396	351
MIN	17	56	176	119	157	107	73	48	52	28	23	47
AC-FT	9,370	20,710	24,020	29,380	15,650	11,320	6,050	5,630	5,810	2,290	4,140	8,170
CFSM	3.81	8.70	9.77	11.9	6.80	4.60	2.54	2.29	2.44	0.93	1.68	3.43
IN.	4.40	9.71	11.26	13.78	7.34	5.31	2.84	2.64	2.72	1.08	1.94	3.83

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2004, BY WATER YEAR (WY)

MEAN	87.2	288	402	394	360	305	230	135	90.3	47.4	32.7	40.5
MAX	298	622	756	756	797	621	454	261	187	122	71.2	137
(WY)	(1998)	(1984)	(1997)	(1971)	(1999)	(1972)	(1991)	(1984)	(1981)	(1983)	(1968)	(2004)
MIN	14.6	37.4	78.4	68.6	92.5	90.9	102	65.1	33.3	27.1	19.3	18.6
(WY)	(1988)	(1994)	(1977)	(1977)	(1977)	(1992)	(2004)	(1994)	(1992)	(1992)	(1992)	(1987)

CHEHALIS RIVER BASIN

12025700 SKOOKUMCHUCK RIVER NEAR VAIL, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1968 - 2004	
ANNUAL TOTAL	79,172		71,868		200	
ANNUAL MEAN	217		196		302	1999
HIGHEST ANNUAL MEAN					103	1977
LOWEST ANNUAL MEAN					5,550	Feb 8, 1996
HIGHEST DAILY MEAN	2,770	Jan 31	1,840	Jan 29	14	Oct 11, 1987
LOWEST DAILY MEAN	16	Sep 1	17	Oct 1	14	Oct 17, 1987
ANNUAL SEVEN-DAY MINIMUM	16	Aug 31	19	Oct 1	14	
ANNUAL RUNOFF (AC-FT)	157,000		142,600		145,100	
ANNUAL RUNOFF (CFSM)	5.42		4.91		5.01	
ANNUAL RUNOFF (INCHES)	73.63		66.84		68.04	
10 PERCENT EXCEEDS	511		418		459	
50 PERCENT EXCEEDS	130		116		114	
90 PERCENT EXCEEDS	19		33		26	

e Estimated

12026150 SKOOKUMCHUCK RIVER BELOW BLOODY RUN CREEK, NEAR CENTRALIA, WA

LOCATION.--Lat 46°47'25", long 122°44'03", in NW¹/₄NW¹/₄, sec.18, T.15 N., R.1 E., Thurston County, Hydrologic Unit 17100103, on right bank 0.7 mi downstream from Bloody Run Creek, 1.2 mi downstream from Skookumchuck Dam, 12 mi northeast of Centralia, and at mile 20.7.

DRAINAGE AREA.--65.9 mi². Prior to August 1969, 61.7 mi².

PERIOD OF RECORD.--April 1929 to November 1933, October 1939 to current year. Monthly discharge only for some periods, published in WSP 1316 and 1736. Published as "near Centralia" (12026000) prior to August 1969.

GAGE.--Water-stage recorder. Datum of gage is 317.34 ft above NGVD of 1929. Apr. 1, 1929, to Sept. 30, 1931, and Feb. 1, 1932, to Dec. 6, 1933, nonrecording gage at site 1.1 mi upstream at different datum. Oct. 9, 1939, to July 31, 1969, at site 1.3 mi upstream at datum 301.04 ft above NGVD of 1929.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Skookumchuck Dam since January 1971. No diversions upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--69 years (water years 1930-33, 1940-2004), 255 ft³/s, 184,700 acre-ft/yr, unadjusted. 33 years (water years 1972-2004), 261 ft³/s, 188,800 acre-ft/yr, regulated period.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,020 ft³/s, Feb. 8, 1996, gage height, 13.41 ft, result of flow over dam computation, provided by Pacific Power & Light; minimum discharge, 12 ft³/s, May 28, 1970, caused by pumping during dam construction.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 30	0645	*2,670	*10.62	No other peak greater than base discharge.			

Minimum discharge, 106 ft³/s, Oct. 6, 7, gage height, 6.02 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	114	178	208	237	1,000	247	227	131	126	112	116	135
2	114	180	203	220	783	226	203	131	126	112	113	135
3	113	179	208	204	639	215	186	124	124	112	112	133
4	112	177	205	196	549	225	185	121	122	112	115	131
5	112	175	214	193	465	261	185	122	121	112	118	130
6	114	168	636	194	425	344	182	120	121	112	118	130
7	115	162	706	267	440	357	182	118	124	112	117	131
8	114	160	536	848	407	330	184	119	118	112	117	135
9	114	160	413	1,070	363	296	184	119	115	112	117	134
10	120	161	357	1,120	314	265	183	119	115	113	116	134
11	124	167	330	921	284	233	182	120	114	113	115	150
12	128	164	376	661	255	213	165	119	112	113	116	139
13	128	162	565	536	236	190	155	116	112	113	115	139
14	127	161	961	481	233	181	155	114	113	112	114	140
15	127	161	833	565	241	224	155	112	113	112	113	148
16	135	170	638	599	246	223	154	112	112	112	115	154
17	137	180	591	483	332	214	154	111	112	112	115	162
18	139	199	501	404	365	209	153	111	112	114	115	161
19	139	238	423	368	399	207	153	111	112	120	113	161
20	152	223	425	321	368	197	153	113	112	118	112	166
21	180	206	433	288	321	195	151	115	112	114	114	163
22	176	190	385	260	284	192	149	116	112	114	115	162
23	179	184	338	286	256	188	148	117	112	114	111	162
24	176	188	323	378	232	186	146	116	112	112	116	160
25	177	209	412	405	221	191	146	114	112	112	141	160
26	176	209	416	369	206	197	134	122	112	114	146	160
27	176	195	374	337	231	195	134	126	112	116	133	160
28	177	198	362	388	255	218	136	136	112	118	128	160
29	179	220	334	1,590	254	280	133	134	112	117	127	160
30	179	211	292	2,420	---	278	132	128	112	118	131	160
31	177	---	259	1,460	---	248	---	127	---	117	136	---
TOTAL	4,430	5,535	13,257	18,069	10,604	7,225	4,889	3,714	3,456	3,526	3,700	4,455
MEAN	143	184	428	583	366	233	163	120	115	114	119	148
MAX	180	238	961	2,420	1,000	357	227	136	126	120	146	166
MIN	112	160	203	193	206	181	132	111	112	112	111	130
AC-FT	8,790	10,980	26,300	35,840	21,030	14,330	9,700	7,370	6,850	6,990	7,340	8,840

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2004, BY WATER YEAR (WY)

	140	230	491	489	462	378	291	180	135	104	98.1	136
MEAN	140	230	491	489	462	378	291	180	135	104	98.1	136
MAX	230	552	1,100	910	1,131	829	590	365	254	140	134	167
(WY)	(1998)	(1984)	(1978)	(1974)	(1999)	(1972)	(1991)	(1984)	(1990)	(1997)	(1997)	(1983)
MIN	91.7	75.8	95.8	92.6	62.5	88.0	145	109	85.4	81.7	78.9	114
(WY)	(2003)	(2003)	(1977)	(1977)	(1977)	(1977)	(1973)	(1989)	(1989)	(1992)	(1985)	(2003)

CHEHALIS RIVER BASIN

12026150 SKOOKUMCHUCK RIVER BELOW BLOODY RUN CREEK, NEAR CENTRALIA, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1972 - 2004	
ANNUAL TOTAL	88,889		82,860			
ANNUAL MEAN	244		226		261	
HIGHEST ANNUAL MEAN					413	1999
LOWEST ANNUAL MEAN					119	1977
HIGHEST DAILY MEAN	2,900	Jan 31	2,420	Jan 30	6,600	Feb 8, 1996
LOWEST DAILY MEAN	79	Jul 28	111	May 17	52	Feb 18, 1977
ANNUAL SEVEN-DAY MINIMUM	81	Jul 22	112	May 14	53	Feb 14, 1977
ANNUAL RUNOFF (AC-FT)	176,300		164,400		188,800	
10 PERCENT EXCEEDS	502		406		503	
50 PERCENT EXCEEDS	145		160		146	
90 PERCENT EXCEEDS	86		112		96	

12026400 SKOOKUMCHUCK RIVER NEAR BUCODA, WA

LOCATION.--Lat 46°46'20", long 122°55'23", in SW¼NW¼, sec.22, T.15 N., R.2 W., Thurston County, Hydrologic Unit 17100103, on left bank 100 ft downstream from bridge on State Highway 507, 3.3 mi southwest of Bucoda, and at mile 6.4.

DRAINAGE AREA.--112 mi².

PERIOD OF RECORD.--December 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 198.19 ft above NGVD of 1929. Prior to Oct. 1, 1992, at datum 0.41 ft higher.

REMARKS.--No estimated daily discharges. Records good, except for flows above 700 ft³/s, which are poor. Flow regulated by Skookumchuck Dam since January 1971. An average of 30 ft³/s is diverted at point 0.5 mi upstream for consumptive use at Centralia Steam Electric Project. During peak demand months, up to 54 ft³/s may be diverted for periods of one day or less. Other minor diversions for domestic use and irrigation upstream from station. Water temperatures, October 1968 to September 1971. Sediment records, July 1968 to September 1971.

AVERAGE DISCHARGE.--33 years (water years 1972-2004), 350 ft³/s, 253,600 acre-ft/yr, regulated.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft³/s, Feb. 8, 1996, gage height, 17.87 ft, present datum, estimated based on comparison with upstream gaging stations; minimum discharge, 21 ft³/s, Aug. 15, 16, 18, 19, 20, 1970, gage height, 3.85 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,750 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 30	1445	*3,900	*14.20	No other peak greater than base discharge.			

Minimum discharge, 70 ft³/s, Aug. 14-20, gage height, 5.49 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	141	390	325	1,350	306	263	125	130	86	74	109
2	79	145	343	302	1,010	282	237	131	122	86	75	109
3	79	146	346	281	812	273	213	129	116	86	75	106
4	80	142	329	266	685	281	206	121	112	86	77	104
5	78	138	332	253	594	313	201	129	122	86	82	102
6	79	135	705	254	537	388	197	120	123	86	85	101
7	84	126	845	330	535	417	195	119	113	86	81	100
8	83	124	653	920	482	389	194	119	110	86	78	105
9	87	124	507	1,350	444	345	194	120	98	85	79	106
10	96	126	441	1,380	399	315	191	117	98	86	76	104
11	96	139	417	1,260	365	282	189	117	96	86	76	160
12	101	140	447	916	334	262	179	117	91	84	76	138
13	118	138	607	719	311	238	161	114	97	83	75	130
14	96	133	1,200	616	305	223	160	112	98	82	73	143
15	95	133	1,180	655	317	235	159	110	95	80	72	157
16	105	148	884	711	330	255	161	109	92	83	73	172
17	109	203	736	600	403	236	165	109	90	79	71	168
18	107	303	625	515	437	233	159	105	88	78	72	172
19	107	633	523	477	464	238	156	104	89	78	73	177
20	125	669	495	421	448	224	161	103	89	76	71	166
21	276	500	499	377	405	217	160	102	88	76	76	157
22	204	347	458	343	370	214	153	100	88	75	97	149
23	198	280	406	397	340	206	151	106	89	73	85	145
24	175	283	386	563	310	211	146	99	89	74	85	143
25	162	395	505	599	298	222	142	94	89	73	126	140
26	154	497	545	531	285	255	152	101	89	74	189	137
27	148	374	496	471	286	272	126	124	89	73	143	134
28	148	334	486	483	307	273	125	153	88	77	115	122
29	148	587	455	1,600	310	308	122	166	87	76	106	118
30	146	500	397	3,610	---	313	118	148	86	77	104	126
31	143	---	353	2,330	---	287	---	144	---	75	109	---
TOTAL	3,784	8,083	16,991	23,855	13,473	8,513	5,136	3,667	2,951	2,491	2,749	4,000
MEAN	122	269	548	770	465	275	171	118	98.4	80.4	88.7	133
MAX	276	669	1,200	3,610	1,350	417	263	166	130	86	189	177
MIN	78	124	329	253	285	206	118	94	86	73	71	100
AC-FT	7,510	16,030	33,700	47,320	26,720	16,890	10,190	7,270	5,850	4,940	5,450	7,930

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2004, BY WATER YEAR (WY)

MEAN	139	342	717	717	678	547	395	223	153	99.5	81.8	123
MAX	294	846	1,669	1,367	1,559	1,446	970	461	331	156	123	180
(WY)	(1998)	(1984)	(1997)	(1997)	(1996)	(1972)	(1991)	(1984)	(1990)	(1983)	(1997)	(1978)
MIN	70.5	45.4	105	95.0	85.7	130	171	118	78.5	50.1	53.5	85.6
(WY)	(2003)	(2003)	(1977)	(1977)	(1977)	(2001)	(2004)	(1994)	(1979)	(2003)	(2003)	(2003)

CHEHALIS RIVER BASIN

12026400 SKOOKUMCHUCK RIVER NEAR BUCODA, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1972 - 2004	
ANNUAL TOTAL	111,078		95,693			
ANNUAL MEAN	304		261		350	
HIGHEST ANNUAL MEAN					571	1972
LOWEST ANNUAL MEAN					143	2001
HIGHEST DAILY MEAN	4,520	Feb 1	3,610	Jan 30	8,560	Feb 8, 1996
LOWEST DAILY MEAN	41	Jul 28	71	Aug 17	40	Dec 6, 2002
ANNUAL SEVEN-DAY MINIMUM	43	Jul 24	72	Aug 14	41	Nov 30, 2002
ANNUAL RUNOFF (AC-FT)	220,300		189,800		253,600	
10 PERCENT EXCEEDS	677		525		758	
50 PERCENT EXCEEDS	154		147		165	
90 PERCENT EXCEEDS	51		79		84	

12027500 CHEHALIS RIVER NEAR GRAND MOUND, WA

LOCATION.--Lat 46°46'34", long 123°02'04", in NE $\frac{1}{4}$ NE $\frac{1}{4}$, sec.22, T.15 N., R.3 W., Thurston County, Hydrologic Unit 17100103, on left bank at downstream side of highway bridge at Meadows, 1.5 mi southwest of Grand Mound, 7.0 mi downstream from Skookumchuck River, and at mile 59.9.

DRAINAGE AREA.--895 mi².

PERIOD OF RECORD.--October 1928 to current year.

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1286: 1929-30(M), 1931, 1932-34(M).

GAGE.--Water-stage recorder. Datum of gage is 123.65 ft above NGVD of 1929. Prior to Oct. 3, 1934, nonrecording gage at present site at datum 3.0 ft higher.

REMARKS.--No estimated daily discharges. Records good. Minor effect from regulation by Skookumchuck Dam since January 1971. Up to 54 ft³/s of Skookumchuck River is consumptively used at Centralia steam generating plant. Many small diversions for irrigation and domestic use upstream from station, including about 3 ft³/s for municipal water supply for Centralia and Chehalis. Water temperatures March 1952 to September 1974. Miscellaneous suspended sediment data published for water years 1962-64. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--76 years (water years 1929-2004), 2,808 ft³/s, 42.62 in/yr, 2,034,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 74,800 ft³/s, Feb. 9, 1996, gage height, 19.98 ft; minimum discharge, 82 ft³/s, Aug. 30, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 31	0200	*20,400	*13.88	No other peak greater than base discharge.			

Minimum discharge, 187 ft³/s, Aug. 18-21, gage height, 1.92 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	194	931	7,190	3,390	15,500	2,650	2,410	889	1,630	382	226	561
2	197	912	5,400	3,140	11,500	2,510	2,120	858	1,340	364	222	522
3	197	937	4,920	2,910	9,910	2,320	1,900	819	1,130	357	213	513
4	198	896	4,470	2,790	7,900	2,540	1,750	782	971	356	211	483
5	203	848	4,170	2,510	6,350	2,910	1,630	792	860	361	219	442
6	205	802	6,370	2,330	5,110	3,740	1,520	798	829	354	246	411
7	221	758	7,650	2,740	4,730	3,820	1,430	776	966	340	273	388
8	256	732	6,300	5,390	4,200	3,420	1,370	866	1,010	348	397	370
9	299	724	5,000	8,700	3,700	3,050	1,310	864	877	339	356	362
10	488	705	4,310	9,500	3,310	2,730	1,230	800	795	324	281	368
11	531	817	4,260	9,340	3,010	2,450	1,180	783	786	323	244	446
12	502	1,330	4,050	7,810	2,740	2,230	1,120	823	763	321	224	1,130
13	1,400	1,130	4,770	6,530	2,510	2,050	1,080	803	746	307	211	873
14	1,320	996	8,970	5,730	2,410	1,890	1,070	773	933	293	201	1,020
15	842	926	10,700	5,850	2,700	1,760	1,230	771	894	283	198	1,200
16	767	1,080	9,170	5,640	3,510	1,700	1,280	775	789	275	195	2,100
17	3,480	2,630	7,630	4,730	4,160	1,590	1,310	793	704	275	190	1,920
18	3,960	5,410	6,140	4,100	4,270	1,540	1,250	790	644	269	188	1,960
19	1,960	11,200	4,900	4,010	4,270	1,760	1,180	772	592	264	187	2,200
20	1,740	12,200	4,200	3,680	3,970	1,780	1,320	768	555	260	187	2,240
21	9,100	9,390	3,810	3,290	3,540	1,600	1,670	760	535	256	193	1,740
22	7,050	6,450	3,380	2,970	3,180	1,500	2,040	744	512	254	304	1,400
23	3,720	4,640	3,010	3,270	2,850	1,410	1,820	816	493	247	714	1,190
24	2,700	4,060	2,900	4,650	2,580	1,420	1,570	881	482	242	554	1,060
25	2,060	4,930	4,450	5,250	2,500	1,940	1,390	782	477	235	664	955
26	1,640	8,340	5,050	4,780	2,630	2,620	1,270	708	466	226	2,000	868
27	1,380	7,460	4,510	4,360	2,630	4,070	1,150	971	442	224	2,100	797
28	1,210	5,890	5,120	4,190	2,840	4,620	1,060	1,460	421	224	1,400	739
29	1,180	9,250	5,070	9,610	2,730	3,760	999	1,990	402	222	980	692
30	1,150	10,200	4,350	18,200	---	3,170	936	1,690	395	223	761	657
31	1,040	---	3,700	19,600	---	2,760	---	1,770	---	226	637	---
TOTAL	51,190	116,574	165,920	180,990	131,240	77,310	42,595	28,667	22,439	8,974	14,976	29,607
MEAN	1,651	3,886	5,352	5,838	4,526	2,494	1,420	925	748	289	483	987
MAX	9,100	12,200	10,700	19,600	15,500	4,620	2,410	1,990	1,630	382	2,100	2,240
MIN	194	705	2,900	2,330	2,410	1,410	936	708	395	222	187	362
AC-FT	101,500	231,200	329,100	359,000	260,300	153,300	84,490	56,860	44,510	17,800	29,700	58,730
CFSM	1.85	4.34	5.98	6.52	5.06	2.79	1.59	1.03	0.84	0.32	0.54	1.10
IN.	2.13	4.85	6.90	7.52	5.45	3.21	1.77	1.19	0.93	0.37	0.62	1.23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2004, BY WATER YEAR (WY)

	1929	1937	1977	1977	1992	1992	1939	1939	1992	1970	1967	1967
MEAN	917	3,797	6,309	6,368	5,843	4,525	2,936	1,382	810	379	244	344
MAX	3,643	9,697	19,280	13,900	13,680	9,477	6,787	3,496	2,482	934	570	1,289
(WY)	(1998)	(1956)	(1934)	(1971)	(1999)	(1972)	(1937)	(1948)	(1936)	(1983)	(1968)	(1978)
MIN	125	221	884	860	1,201	1,354	1,086	549	352	174	118	117
(WY)	(1953)	(1937)	(1977)	(1977)	(1977)	(1992)	(1939)	(1939)	(1992)	(1970)	(1967)	(1967)

CHEHALIS RIVER BASIN

12027500 CHEHALIS RIVER NEAR GRAND MOUND, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1929 - 2004	
ANNUAL TOTAL	1,069,981		870,482			
ANNUAL MEAN	2,931		2,378		2,808	
HIGHEST ANNUAL MEAN					4,480	
LOWEST ANNUAL MEAN					1,122	
HIGHEST DAILY MEAN	22,300	Feb 1	19,600	Jan 31	64,200	Feb 9, 1996
LOWEST DAILY MEAN	148	Aug 24	187	Aug 19	85	Aug 30, 1967
ANNUAL SEVEN-DAY MINIMUM	150	Aug 21	191	Aug 15	91	Aug 28, 1967
ANNUAL RUNOFF (AC-FT)	2,122,000		1,727,000		2,034,000	
ANNUAL RUNOFF (CFSM)	3.28		2.66		3.14	
ANNUAL RUNOFF (INCHES)	44.47		36.18		42.62	
10 PERCENT EXCEEDS	7,640		5,480		7,420	
50 PERCENT EXCEEDS	1,640		1,280		1,240	
90 PERCENT EXCEEDS	178		259		222	

12031000 CHEHALIS RIVER AT PORTER, WA

LOCATION.--Lat 46°56'17", long 123°18'45", on north line of NE¼, sec.28, T.17 N., R.5 W., Grays Harbor County, Hydrologic Unit 17100103, at downstream end of left bank bridge pier, 30 ft downstream from Porter Creek, 0.1 mi west of Porter, and at mile 33.3.

DRAINAGE AREA.--1,294 mi².

PERIOD OF RECORD.--January 1952 to September 1972, water years 1973-75 (annual maximum), May 1975 to September 1985, October 1985 to September 1986 (monthly means only), October 1986 to current year. Daily routed values for October 1985 to September 1986 are available in the files of the U.S. Geological Survey.

REVISED RECORDS.--WSP 1716: Drainage area. WSP 1932: 1954, 1956, 1960(M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 23.64 ft above NGVD of 1929.

REMARKS.--Records fair. Minor effect from regulation on Skookumchuck River by Skookumchuck Dam since January 1971. Up to 54 ft³/s of Skookumchuck River is consumptively used at Centralia steam generating plant. Many small diversions for irrigation and domestic use upstream from station, including about 3 ft³/s for municipal water supply for Centralia and Chehalis. U.S. Geological Survey satellite telemeter at station. Suspended sediment October 1961 to September 1971. Water temperatures July 1959 to September 1960, October 1961 to July 1972. Chemical analyses July 1959 to September 1973, October 1974 to September 1994.

AVERAGE DISCHARGE.--49 years (water years 1953-72, 1976-2004), 4,069 ft³/s, 42.72 in/yr, 2,948,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,700 ft³/s, Feb. 9, 1996, gage height, 25.22 ft; minimum discharge, 164 ft³/s, Oct. 17, 1952, gage height, 2.25 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 28, 1937, reached a stage of 24.7 ft, from levels by Grays Harbor County. Flood of December 1933 reached a stage of 23.13 ft, from river profile by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb 1	0700	*24,900	*20.66	No other peak greater than base discharge.			

Minimum discharge, 279 ft³/s, Oct. 2, gage height, 3.22 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	283	1,590	11,400	5,080	23,800	3,980	3,610	1,270	2,070	602	380	760
2	282	1,540	8,470	4,750	19,300	3,860	3,220	1,220	1,750	583	380	710
3	285	1,510	7,260	4,450	15,600	3,660	2,910	1,180	1,500	576	379	670
4	285	1,450	6,800	4,230	12,700	3,840	2,670	1,130	1,310	569	383	640
5	290	1,350	6,350	3,910	10,100	4,350	2,480	1,110	1,200	569	392	594
6	295	1,270	8,290	3,710	8,270	5,150	2,320	1,110	1,200	565	482	554
7	343	1,200	10,300	4,040	7,360	5,490	2,180	1,090	1,280	556	518	525
8	339	1,150	9,010	6,030	6,650	5,050	2,070	1,160	1,360	547	533	502
9	390	1,120	7,430	9,560	5,910	4,600	1,970	1,170	1,250	549	577	498
10	480	1,090	6,460	11,300	5,340	4,180	1,860	1,110	1,150	536	485	495
11	622	1,240	6,170	11,700	4,900	3,820	1,770	1,050	1,120	531	430	799
12	725	1,630	5,940	10,600	4,530	3,550	1,680	1,030	1,090	519	397	1,020
13	989	1,670	6,470	9,030	4,200	3,280	1,620	1,020	1,110	504	376	1,260
14	1,550	1,470	9,250	7,970	4,090	3,030	1,620	961	1,180	483	364	1,180
15	1,090	1,370	12,400	7,740	4,450	2,820	1,740	927	1,250	467	357	1,600
16	1,580	1,590	12,400	7,660	5,310	2,670	1,910	907	1,130	455	351	2,080
17	4,490	3,050	10,300	6,890	5,940	2,530	1,910	899	1,020	447	345	2,480
18	5,270	6,580	8,630	6,180	6,260	2,500	1,850	881	939	441	345	2,370
19	3,210	12,100	7,150	6,010	6,240	2,660	1,760	851	872	432	342	2,490
20	4,100	15,400	6,180	5,690	5,950	2,770	1,850	839	826	429	336	2,730
21	11,600	e13,800	5,640	5,220	5,450	2,520	2,210	820	791	419	359	2,220
22	12,100	9,970	5,120	4,790	4,960	2,350	2,640	830	761	410	626	1,770
23	6,950	7,320	4,650	4,860	4,520	2,230	2,470	890	747	402	730	1,500
24	5,050	6,350	4,510	5,970	4,170	2,300	2,160	989	737	392	843	1,330
25	4,030	7,040	5,650	6,820	4,050	2,810	1,930	938	728	385	1,040	1,190
26	3,340	9,970	6,790	6,700	4,120	3,660	1,760	918	710	379	2,140	1,090
27	2,770	10,300	6,380	6,360	4,070	4,980	1,630	1,170	682	374	2,580	1,000
28	2,460	9,030	6,550	6,310	4,210	6,030	1,500	1,650	653	374	1,930	929
29	2,250	11,700	6,770	10,200	4,120	5,260	1,410	2,200	628	373	1,350	867
30	2,060	e14,200	6,220	18,200	---	4,560	1,330	2,200	611	369	1,050	817
31	1,800	---	5,520	23,200	---	4,030	---	2,100	---	379	870	---
TOTAL	81,308	159,050	230,460	235,160	206,570	114,520	62,040	35,620	31,655	14,616	21,670	36,670
MEAN	2,623	5,302	7,434	7,586	7,123	3,694	2,068	1,149	1,055	471	699	1,222
MAX	12,100	15,400	12,400	23,200	23,800	6,030	3,610	2,200	2,070	602	2,580	2,730
MIN	282	1,090	4,510	3,710	4,050	2,230	1,330	820	611	369	336	495
AC-FT	161,300	315,500	457,100	466,400	409,700	227,200	123,100	70,650	62,790	28,990	42,980	72,730
CFSM	2.03	4.10	5.75	5.86	5.50	2.85	1.60	0.89	0.82	0.36	0.54	0.94
IN.	2.34	4.57	6.63	6.76	5.94	3.29	1.78	1.02	0.91	0.42	0.62	1.05

CHEHALIS RIVER BASIN

12031000 CHEHALIS RIVER AT PORTER, WA—Continued

DISCHARGE, CUBIC FEET PER SECOND—CONTINUED
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2004, BY WATER YEAR (WY)													
MEAN	1,256	5,165	8,914	9,356	8,445	6,628	4,391	2,112	1,200	611	416	547	
MAX	4,627	12,770	17,710	19,050	20,550	12,920	9,130	4,202	2,456	1,295	838	1,879	
(WY)	(1998)	(1956)	(1978)	(1971)	(1999)	(1972)	(1991)	(1984)	(1968)	(1983)	(1968)	(1978)	
MIN	196	376	1,273	1,360	1,711	2,287	2,025	1,024	528	350	223	228	
(WY)	(1953)	(1953)	(1977)	(1977)	(1977)	(2001)	(1977)	(1994)	(1992)	(1992)	(1967)	(1967)	
SUMMARY STATISTICS													
	FOR 2003 CALENDAR YEAR					FOR 2004 WATER YEAR			WATER YEARS 1953 - 2004				
ANNUAL TOTAL	1,499,107					1,229,339							
ANNUAL MEAN	4,107					3,359			4,069				
HIGHEST ANNUAL MEAN									6,492				
LOWEST ANNUAL MEAN									1,578				
HIGHEST DAILY MEAN	24,500					Feb 2			23,800		Feb 1		55,000
LOWEST DAILY MEAN	260					Sep 6			282		Oct 2		166
ANNUAL SEVEN-DAY MINIMUM	274					Sep 1			295		Oct 1		169
ANNUAL RUNOFF (AC-FT)	2,973,000					2,438,000			2,948,000				
ANNUAL RUNOFF (CFSM)	3.17					2.60			3.14				
ANNUAL RUNOFF (INCHES)	43.10					35.34			42.72				
10 PERCENT EXCEEDS	10,400					7,810			10,700				
50 PERCENT EXCEEDS	2,710					1,780			1,980				
90 PERCENT EXCEEDS	329					430			376				

e Estimated

12035000 SATSOP RIVER NEAR SATSOP, WA

LOCATION.--Lat 47°00'03", long 123°29'37", in NE $\frac{1}{4}$ SE $\frac{1}{4}$, sec.36, T.18 N., R.7 W., Grays Harbor County, Hydrologic Unit 17100104, in west pier of bridge on old U.S. Highway 410, 0.6 mi west of Satsop, and 2.3 mi upstream from mouth.

DRAINAGE AREA.--299 mi².

PERIOD OF RECORD.--March 1929 to current year.

REVISED RECORDS.--WSP 1286: 1930-35(M), 1937(M). WSP 1716: Drainage area. WSP 1932: 1945, 1949(M), 1951(M), 1956-57(M), 1959(M).

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929. Prior to Mar. 19, 1938, nonrecording gage at site 60 ft upstream at datum 20.9 ft higher.

REMARKS.--Records good. No regulation or diversion upstream from station. Chemical analyses July 1960 to September 1971, October 1974 to September 1975, October 1976 to June 1980; sediment records November 1961 to June 1965 (partial-record station). U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--75 years (water years 1930-2004), 2,044 ft³/s, 92.90 in/yr, 1,481,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 63,600 ft³/s, Mar. 19, 1997, elevation, 38.87 ft; maximum elevation, 38.9 ft, Jan. 22, 1935, from floodmarks, present datum; minimum discharge, 147 ft³/s, Aug. 31, Sept. 1, 2, 1994; minimum elevation, 21.66 ft, present datum, Sept. 3-6, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in November 1909 reached a stage of 37.1 ft, from high-water mark, at railroad bridge 300 ft downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 13,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 17	2200	17,200	32.77	Nov 29	0300	23,700	34.18
Oct 21	0500	*35,900	*36.54	Jan 30	0900	14,400	31.88
Nov 18	1400	22,100	34.04				

Minimum discharge, 189 ft³/s, Oct. 1-6.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	192	1,230	5,740	2,440	6,170	1,990	1,830	732	663	399	267	351
2	189	1,190	4,840	2,230	5,290	1,840	1,660	709	603	391	264	353
3	191	1,110	5,470	2,090	4,700	1,830	1,540	693	561	392	267	331
4	189	1,030	4,600	1,930	4,130	1,870	1,430	676	530	384	269	315
5	191	969	5,060	1,790	3,580	2,180	1,340	665	535	373	264	303
6	195	916	8,200	1,790	3,440	2,670	1,260	645	636	371	296	293
7	228	876	7,260	2,100	3,530	3,590	1,200	645	806	364	538	288
8	238	839	5,870	4,310	3,080	4,910	1,140	661	719	353	445	285
9	313	801	4,880	5,340	2,750	3,640	1,080	623	662	353	356	303
10	388	789	4,290	6,240	2,510	2,880	1,030	608	627	354	320	295
11	394	920	3,830	5,760	2,320	2,460	990	589	592	351	301	1,020
12	894	850	4,200	4,490	2,140	2,180	949	577	562	343	289	811
13	1,200	795	4,390	4,550	1,990	1,970	927	562	737	336	283	693
14	682	766	4,520	5,460	2,460	1,820	967	548	802	328	272	839
15	505	782	4,580	7,230	4,070	1,680	1,050	540	706	322	267	1,200
16	4,610	1,440	4,540	5,610	4,720	1,560	981	534	644	319	264	1,370
17	11,900	3,330	5,240	4,230	4,390	1,470	935	528	602	316	261	1,640
18	7,920	16,500	4,280	3,900	4,320	1,490	896	511	569	311	258	1,600
19	4,620	15,400	3,740	4,150	3,880	1,520	916	504	544	307	256	1,620
20	14,200	7,170	3,610	3,920	3,260	1,420	1,090	496	520	315	251	1,320
21	25,600	4,450	3,480	3,340	2,840	1,330	1,330	489	501	310	262	1,060
22	8,330	3,340	3,130	2,940	2,520	1,260	1,270	498	484	301	316	902
23	5,230	2,810	2,830	2,990	2,280	1,210	1,120	534	475	293	291	810
24	3,670	2,980	3,220	2,850	2,150	1,390	1,030	494	469	289	298	717
25	2,850	3,680	4,660	2,630	2,330	1,840	956	474	463	284	597	649
26	2,340	3,840	3,920	2,660	2,360	3,670	904	494	456	280	e1,200	599
27	1,960	3,160	3,520	3,600	2,350	4,450	857	560	436	277	e900	562
28	1,780	7,290	3,390	5,400	2,280	3,320	826	707	421	274	e700	532
29	1,630	17,100	3,070	7,590	2,130	2,630	791	609	410	272	e580	505
30	1,460	8,040	2,790	12,400	---	2,350	759	690	406	270	e450	483
31	1,330	---	2,640	8,050	---	2,070	---	760	---	270	e390	---
TOTAL	105,419	114,393	135,790	134,010	93,970	70,490	33,054	18,355	17,141	10,102	11,972	22,049
MEAN	3,401	3,813	4,380	4,323	3,240	2,274	1,102	592	571	326	386	735
MAX	25,600	17,100	8,200	12,400	6,170	4,910	1,830	760	806	399	1,200	1,640
MIN	189	766	2,640	1,790	1,990	1,210	759	474	406	270	251	285
AC-FT	209,100	226,900	269,300	265,800	186,400	139,800	65,560	36,410	34,000	20,040	23,750	43,730
CFSM	11.4	12.8	14.6	14.5	10.8	7.60	3.68	1.98	1.91	1.09	1.29	2.46
IN.	13.12	14.23	16.89	16.67	11.69	8.77	4.11	2.28	2.13	1.26	1.49	2.74

CHEHALIS RIVER BASIN

12035000 SATSOP RIVER NEAR SATSOP, WA—Continued

DISCHARGE, CUBIC FEET PER SECOND—CONTINUED
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2004, BY WATER YEAR (WY)													
MEAN	1,165	3,014	4,306	4,195	3,823	3,008	2,063	1,135	700	451	332	436	
MAX	3,814	6,887	9,553	9,598	8,123	7,785	4,038	2,696	1,686	1,133	674	1,791	
(WY)	(1976)	(1991)	(1995)	(1953)	(1999)	(1997)	(1937)	(1948)	(2000)	(1983)	(2001)	(1978)	
MIN	201	268	1,361	1,127	1,148	1,155	898	592	407	287	198	208	
(WY)	(1988)	(1937)	(1986)	(1949)	(1993)	(1992)	(1942)	(2004)	(1992)	(1951)	(1994)	(1938)	
SUMMARY STATISTICS													
	FOR 2003 CALENDAR YEAR					FOR 2004 WATER YEAR			WATER YEARS 1930 - 2004				
ANNUAL TOTAL	866,893					766,745							
ANNUAL MEAN	2,375					2,095			2,044				
HIGHEST ANNUAL MEAN									3,235				
LOWEST ANNUAL MEAN									1,199				
HIGHEST DAILY MEAN	25,600					Oct 21			25,600		Oct 21		51,800
LOWEST DAILY MEAN	189					Oct 2			189		Oct 2		147
ANNUAL SEVEN-DAY MINIMUM	191					Sep 29			196		Oct 1		154
ANNUAL RUNOFF (AC-FT)	1,719,000					1,521,000			1,481,000				
ANNUAL RUNOFF (CFSM)	7.94					7.01			6.84				
ANNUAL RUNOFF (INCHES)	107.85					95.39			92.90				
10 PERCENT EXCEEDS	5,570					4,670			4,780				
50 PERCENT EXCEEDS	1,240					1,000			1,150				
90 PERCENT EXCEEDS	221					294			283				

e Estimated

12035002 CHEHALIS RIVER NEAR SATSOP, WA

LOCATION.--Lat 46°58'20", long 123°29'25", in NW¼NE¼, sec.14, T.17 N., R.7 W., Grays Harbor County, Hydrologic Unit 17100104, 0.7 mi downstream from Satsop River, 2.1 mi southwest of Satsop, and at mile 19.5.

DRAINAGE AREA.--1,760 mi²

PERIOD OF RECORD.--June 1977 to September 1979 (gage heights and discharge records less than 2,000 ft³/s, unpublished, available in files of Washington Water Science Center), October 1979 to September 1980 (gage heights and discharge records less than 5,000 ft³/s), October 1980 to September 1981 (gage heights and discharge records less than 10,000 ft³/s), October 1981 to September 1983, October 2002 to September 2003.

GAGE.--Acoustic velocity meter with water-stage and velocity-index recorder. Datum of gage is NGVD of 1929. Prior to October 2002, datum 2.66 ft higher.

REMARKS.--Records good, except for discharges between 1,000 ft³/s and 2,500 ft³/s, which are fair, and estimated daily discharges and discharges below 1,000 ft³/s, which are poor. Large diurnal fluctuations at times because of tides. Minor effects from regulation on Skookumchuck River by Skookumchuck Dam since January 1971. Up to 54 ft³/s of Skookumchuck River is consumptively used at Centralia steam generating plant. Many small diversions for irrigation and domestic use upstream from station, including about 3 ft³/s for Centralia and Chehalis. U.S. Geological Survey telemeter at station.

AVERAGE DISCHARGE.--4 years (water years 1982-83, 2003-04), 6,802 ft³/s, 52.48 in/yr, 4,928,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,500 ft³/s, Dec. 18, 1979, gage height, 17.93; minimum discharge -819 ft³/s, Sept. 28, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 51,500 ft³/s, Oct. 21, gage height, 21.85 ft; minimum discharge, -115 ft³/s, Oct. 8, but may have been less during period of missing record; minimum gage height, 3.61 ft, Aug. 21.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	538	3,330	18,900	7,870	36,300	6,280	5,690	2,310	e2,800	e1,030	e646	e1,150
2	510	3,250	14,600	7,270	31,400	5,970	5,100	2,240	e2,470	e987	e647	e1,100
3	520	3,140	13,500	6,730	25,300	5,790	4,750	2,190	e2,140	e981	e657	e1,050
4	502	2,960	11,900	6,290	20,200	6,070	4,400	2,160	e1,930	e961	e663	e989
5	516	2,820	11,700	5,700	15,900	6,990	4,130	2,100	e1,830	e952	e667	e930
6	559	2,660	16,900	e5,640	13,600	8,420	3,900	2,070	e1,910	e943	e796	e888
7	670	2,560	18,400	6,170	12,500	9,690	3,720	2,050	e2,150	e930	e1,070	e851
8	733	2,470	16,100	10,500	11,000	10,800	3,540	2,130	e2,140	e912	e990	e824
9	947	2,390	13,300	15,500	9,610	9,140	3,370	2,120	e1,970	e911	e944	e840
10	1,100	2,410	11,200	17,900	8,610	7,560	3,210	2,040	e1,830	e898	e815	e830
11	1,270	2,730	10,400	18,300	7,840	6,660	3,110	1,950	e1,780	e885	e741	1,810
12	1,880	2,800	10,600	16,300	7,190	6,110	2,990	1,890	e1,720	e872	e696	1,810
13	2,410	2,880	11,400	14,900	6,610	5,450	2,860	1,860	e1,910	e849	e669	2,030
14	2,430	2,650	14,000	14,500	6,990	5,130	2,920	e1,850	e2,030	e820	e648	2,130
15	1,950	2,580	17,200	16,300	9,000	4,780	3,100	e1,790	e2,000	e794	e640	2,790
16	5,940	3,510	17,600	14,600	10,700	4,490	3,210	e1,730	e1,830	e782	e628	3,220
17	16,500	7,360	16,600	12,500	11,000	4,270	3,180	e1,730	e1,680	e771	e618	4,040
18	13,900	25,200	14,000	11,200	11,500	4,350	3,060	e1,670	e1,560	e759	e616	3,900
19	8,330	32,100	11,500	11,200	11,000	4,390	3,000	e1,670	e1,430	e749	e611	4,070
20	16,500	24,800	10,100	10,600	10,000	4,380	3,210	e1,670	e1,390	e753	e599	3,940
21	44,300	20,800	9,300	9,390	9,000	4,090	3,700	e1,670	e1,340	e736	e636	3,330
22	26,900	15,900	8,360	8,410	8,090	3,880	3,970	e1,640	e1,300	e712	e957	2,770
23	15,700	12,200	7,550	8,500	7,310	3,730	3,840	e1,700	e1,260	e697	e1,060	2,440
24	10,900	11,100	7,750	9,710	6,750	4,040	3,410	e1,730	e1,240	e685	e1,180	2,170
25	8,140	12,500	10,400	10,400	6,770	4,810	3,130	e1,700	e1,220	e673	e1,680	1,990
26	6,540	15,400	11,200	10,400	6,930	7,360	2,930	e1,730	e1,200	e658	e3,370	1,850
27	5,500	15,400	10,500	11,100	6,850	9,760	2,820	e2,070	e1,150	e653	e3,490	1,740
28	5,080	17,800	10,600	13,000	6,890	9,800	2,620	e2,510	e1,110	e649	e2,690	1,650
29	4,670	33,600	10,600	18,500	6,580	8,540	2,480	e2,890	e1,060	e647	e1,980	1,560
30	4,140	24,000	9,580	35,200	---	7,520	2,400	e2,950	e1,030	e643	e1,560	1,490
31	3,680	---	8,620	34,800	---	6,450	---	e2,930	---	e649	e1,300	---
TOTAL	213,255	313,300	384,360	399,380	341,420	196,700	103,750	62,740	50,410	24,941	34,264	60,182
MEAN	6,879	10,440	12,400	12,880	11,770	6,345	3,458	2,024	1,680	805	1,105	2,006
MAX	44,300	33,600	18,900	35,200	36,300	10,800	5,690	2,950	2,800	1,030	3,490	4,070
MIN	502	2,390	7,550	5,640	6,580	3,730	2,400	1,640	1,030	643	599	824
AC-FT	423,000	621,400	762,400	792,200	677,200	390,200	205,800	124,400	99,990	49,470	67,960	119,400
CFSM	3.91	5.93	7.04	7.32	6.69	3.60	1.96	1.15	0.95	0.46	0.63	1.14
IN.	4.50	6.62	8.12	8.44	7.21	4.16	2.19	1.33	1.06	0.53	0.72	1.27

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 2004, BY WATER YEAR (WY)

MEAN	3,758	7,303	14,640	15,080	15,490	11,560	7,053	2,476	1,464	1,255	839	1,154
MAX	6,879	10,440	19,380	17,440	24,100	15,360	9,882	2,938	1,680	2,489	1,105	2,006
(WY)	(2004)	(2004)	(1983)	(1983)	(1982)	(2003)	(1982)	(2003)	(2004)	(1983)	(2004)	(2004)
MIN	572	2,560	7,417	12,700	10,760	6,345	3,458	2,024	1,266	785	559	583
(WY)	(2003)	(2003)	(2003)	(2003)	(2003)	(2004)	(2004)	(2004)	(1982)	(2003)	(2003)	(2003)

CHEHALIS RIVER BASIN

12035002 CHEHALIS RIVER NEAR SATSOP, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1982 - 2004	
ANNUAL TOTAL	2,508,769		2,184,702			
ANNUAL MEAN	6,873		5,969		6,802	
HIGHEST ANNUAL MEAN					8,562	
LOWEST ANNUAL MEAN					5,267	
HIGHEST DAILY MEAN	44,300	Oct 21	44,300	Oct 21	47,000	Feb 19, 1982
LOWEST DAILY MEAN	440	Sep 6	502	Oct 4	440	Sep 6, 2003
ANNUAL SEVEN-DAY MINIMUM	484	Aug 31	545	Oct 1	484	Aug 31, 2003
ANNUAL RUNOFF (AC-FT)	4,976,000		4,333,000		4,928,000	
ANNUAL RUNOFF (CFSM)	3.90		3.39		3.86	
ANNUAL RUNOFF (INCHES)	53.00		46.15		52.48	
10 PERCENT EXCEEDS	17,000		14,700		17,400	
50 PERCENT EXCEEDS	4,250		3,100		3,170	
90 PERCENT EXCEEDS	572		752		680	

e Estimated

12035100 CHEHALIS RIVER NEAR MONTESANO, WA

LOCATION.--Lat 46°57'45", long 123°36'12", in NE ¼ SW ¼ sec.18, T.17 N., R.7 W., Grays Harbor County, Hydrologic Unit 17100104, on downstream side of State Highway 107 bridge, 0.2 mi upstream from Wynoochee River, 1.1 mi south of Montesano and at mile 13.2.

DRAINAGE AREA.--1,780 mi².

PERIOD OF RECORD.--October 2001 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3.32 ft above NGVD of 1929.

REMARKS.--Elevation record only. Large diurnal fluctuation because of tides. Minor effect from regulation on Skookumchuck River by Skookumchuck Dam since January 1971. Up to 54 ft³/s of Skookumchuck River is consumptively used at Centralia steam generating plant. Many small diversions for irrigation and domestic use upstream from station, including about 3 ft³/s for municipal water supply for Centralia and Chehalis. U.S. Geological Survey satellite telemeter at station. Chemical analyses, March 1970 to September 1971, October 1977 to June 1980.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded elevation, 18.66 ft Dec. 17, 2001, minimum recorded elevation, -1.17 ft July 12, 2002.

EXTREMES FOR CURRENT YEAR.--Maximum recorded elevation, 16.19 ft Oct. 22; minimum recorded elevation, -1.15 ft July 4.

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.44	0.18	10.81	1.75	12.87	7.94	12.85	5.12	14.22	10.23	11.45	3.74
2	11.82	1.10	11.07	2.22	12.68	6.72	12.65	4.08	14.18	9.59	11.17	2.75
3	11.34	1.12	11.57	2.85	12.72	5.90	12.87	3.44	14.08	7.96	12.04	2.44
4	11.16	1.47	11.84	2.51	13.04	5.70	12.30	2.07	13.56	6.32	12.54	2.06
5	11.51	1.18	12.15	2.42	13.80	5.87	12.05	1.39	13.27	5.00	13.35	2.93
6	11.93	1.06	12.20	1.86	14.35	7.39	13.05	2.74	13.76	4.72	12.79	2.77
7	12.13	1.48	12.67	1.49	14.31	7.00	13.99	3.35	13.24	3.82	13.05	3.78
8	12.89	2.41	12.93	1.27	13.62	5.51	13.99	4.85	12.75	3.27	12.74	3.79
9	12.65	2.13	13.05	0.92	13.44	4.61	14.21	6.15	12.08	2.91	13.09	3.08
10	12.75	1.39	13.12	1.40	13.47	4.18	14.03	6.85	11.99	2.96	12.71	2.43
11	13.23	2.48	12.51	0.70	13.45	4.25	13.56	6.34	12.44	3.59	12.78	2.09
12	12.99	1.76	11.99	1.36	13.56	4.50	13.08	5.87	12.88	3.56	12.78	2.02
13	12.40	1.25	12.11	1.60	13.20	5.13	12.77	5.89	12.97	3.47	12.27	1.90
14	12.13	1.56	11.87	2.41	12.63	5.36	13.08	5.92	12.95	3.72	11.92	1.96
15	12.48	2.55	11.33	3.21	12.15	5.95	13.39	7.03	13.34	4.17	11.35	1.66
16	12.86	2.77	12.40	3.19	12.94	6.73	13.28	5.98	13.59	4.58	11.67	1.32
17	13.09	7.15	11.77	5.39	12.91	7.10	13.57	4.83	13.71	4.34	12.32	1.31
18	11.82	8.74	14.27	6.71	12.92	5.93	13.76	4.20	14.35	4.45	13.45	2.17
19	11.52	6.41	14.88	11.13	13.60	4.63	14.01	3.95	14.11	3.78	12.82	1.24
20	14.79	5.52	14.22	8.97	14.11	3.65	14.05	3.36	13.75	3.27	12.35	1.23
21	15.90	13.74	14.08	7.17	14.37	2.92	14.01	2.63	13.51	3.20	12.85	1.90
22	16.19	10.42	13.97	5.08	14.48	2.46	14.13	2.42	13.50	3.31	13.06	2.20
23	13.79	5.86	14.52	4.29	15.15	2.66	14.31	3.28	13.33	3.72	13.30	2.13
24	13.37	3.66	14.66	3.84	15.66	3.74	14.03	3.53	13.26	4.46	13.45	2.80
25	13.47	2.38	15.12	5.27	15.08	3.90	12.78	3.58	13.14	4.54	13.07	3.47
26	13.91	1.82	14.33	5.47	14.01	3.62	12.98	4.54	13.24	5.33	13.06	4.44
27	14.03	1.48	13.47	4.94	13.33	3.82	13.06	4.73	12.77	5.11	12.56	4.79
28	14.32	1.79	14.37	5.38	12.65	3.82	13.33	5.59	11.74	4.70	11.30	4.77
29	13.35	1.36	15.02	10.02	12.88	4.09	13.08	7.72	11.34	4.45	11.17	5.30
30	12.31	1.32	13.29	9.16	12.39	4.67	15.04	11.28	---	---	11.27	4.23
31	11.28	1.32	---	---	12.61	5.62	14.00	10.51	---	---	10.76	3.57
MONTH	16.19	0.18	15.12	0.70	15.66	2.46	15.04	1.39	14.35	2.91	13.45	1.23

12035380 WYNOOCHEE LAKE NEAR GRISDALE, WA

LOCATION.--Lat 47°23'08", long 123°36'16", in NE ¼ NW ¼ sec.20, T.22 N., R.7 W., Grays Harbor County, Hydrologic Unit 17100104, Olympic National Forest, in monolith No. 6, near center line axis of Wynoochee Dam on Wynoochee River, 2.0 mi north of Grisdale, at river mile 51.8.

DRAINAGE AREA.--41.0 mi².

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929 (levels by Corps of Engineers). Prior to May 22, 1973, staff gage on upstream face of dam.

REMARKS.--Reservoir is formed by concrete gravity-type dam with gate-type spillway. Construction began in 1969 and was completed in 1972. Usable capacity, 67,288 acre-ft between elevation 690 ft, sluice invert level, and 800 ft, full pool elevation at 69,405 acre-ft. Dead storage 2,117 acre-ft below elevation 690 ft. Figures given herein represent total contents. Water is used for power generation, flood control, water supply, and recreation. Tacoma Public Utilities satellite telemetry at station.

COOPERATION.--Daily elevations at 2400 hours, and capacity table furnished by Corps of Engineers, and by Tacoma Public Utilities.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 70,087 acre-ft July 13, 1983, elevation, 800.60 ft; minimum contents observed, 4,227 acre-ft Oct. 19, 1992, elevation, 701.04 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 60,760 acre-ft Oct. 21, elevation, 792.03 ft; minimum contents, 29,084 acre-ft Oct. 8, elevation, 755.36 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
September 30	759.61	32,164	--
October 31	768.55	39,085	+6,921
November 30	776.64	45,919	+6,834
December 31	767.93	38,586	-7,333
Calendar Year 2003	--	--	+2,507
January 31	770.77	40,900	+2,314
February 29	771.32	41,357	+457
March 31	778.93	47,972	+6,615
April 30	785.89	54,548	+6,576
May 31	786.43	55,079	+531
June 30	785.98	54,637	-442
July 31	779.00	48,035	-6,602
August 31	775.60	45,005	-3,030
September 30	776.03	45,382	+377
Water Year 2004	--	--	+13,218

12035400 WYNOOCHEE RIVER NEAR GRISDALE, WA

LOCATION.--Lat 47°22'50", long 123°36'31", in NW¼SW¼, sec.20, T.22 N., R.7 W., Grays Harbor County, Hydrologic Unit 17100104, Olympic National Forest, on right bank 0.5 mi downstream from Wynoochee Dam, 1.7 mi north of Grisdale, 1.7 mi downstream from Scatter Creek, and at mile 51.3.

DRAINAGE AREA.--41.3 mi².

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 630 ft above NGVD of 1929, from topographic map. Prior to Nov. 3, 1967, at site 1,500 ft upstream at different datum.

REMARKS.--Records good except estimated daily discharges, which are fair. Since August 1972, flow regulated by Wynoochee Lake (station 12035380) for flood control, during summer months to augment the natural river flow, and for the water supply for the City of Aberdeen. Some regulation from 1969 to August 1972 due to dam construction. No diversion upstream from station. Tacoma Public Utilities satellite telemeter at station.

AVERAGE DISCHARGE.--39 years (water years 1966-2004), 524 ft³/s, 172.30 in/yr, 379,600 acre-ft/yr, adjusted for storage in Wynoochee Lake since October 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,800 ft³/s, Dec. 12, 1966, gage height, about 18.0 ft, from graph based on gage readings, site and datum then in use; minimum discharge, 0.9 ft³/s, Sept. 10, 12, 1974, gage height, 0.06 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,670 ft³/s, Oct. 18, gage height, 7.09 ft; minimum discharge, 125 ft³/s, Sept. 24, gage height, 1.09 ft; minimum daily discharge, 185 ft³/s July 4.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e240	1,260	1,270	272	819	326	213	209	206	206	196	270
2	e240	1,190	1,270	272	818	527	213	209	206	199	196	264
3	e250	416	1,270	272	818	711	213	209	206	186	196	253
4	e260	370	1,270	272	814	711	213	209	206	185	196	268
5	e270	370	1,270	775	812	688	213	210	206	187	196	272
6	e280	370	1,270	1,260	816	485	213	209	206	186	196	272
7	e280	277	1,270	1,120	815	485	213	209	206	193	196	272
8	294	191	1,270	1,090	817	469	213	207	206	196	196	272
9	234	189	1,270	996	819	317	213	206	206	196	196	272
10	215	189	1,270	820	819	315	213	206	206	199	196	273
11	214	189	1,260	819	671	313	213	206	206	199	196	280
12	239	189	1,270	1,060	523	313	213	206	206	199	196	280
13	227	235	1,270	1,270	523	313	213	206	206	199	196	280
14	218	305	1,270	1,270	523	313	213	206	206	199	196	280
15	277	326	1,120	1,270	523	313	214	206	206	208	196	268
16	912	327	1,010	1,270	523	313	209	206	206	208	196	256
17	1,380	785	1,000	1,260	523	313	209	206	213	199	196	256
18	5,340	683	807	1,260	519	313	210	206	223	199	196	238
19	3,600	1,930	429	1,260	518	303	212	206	223	199	196	220
20	1,960	1,250	428	1,080	515	218	218	206	223	199	196	216
21	3,930	1,250	428	767	512	220	216	206	219	199	196	216
22	5,350	1,250	428	610	512	220	204	206	206	199	196	216
23	1,560	1,620	428	610	512	220	203	206	206	199	196	217
24	1,260	1,510	428	610	513	220	203	206	206	199	196	236
25	1,260	1,270	428	610	522	220	203	206	206	199	196	238
26	1,260	1,270	513	1,020	535	338	203	206	206	199	199	238
27	1,260	1,270	625	1,260	502	412	203	206	206	199	220	258
28	1,260	870	628	1,040	315	410	203	206	206	199	224	312
29	1,260	1,310	494	1,040	325	393	206	206	206	197	268	330
30	1,250	1,770	279	914	---	219	211	206	206	199	258	330
31	1,250	---	272	e819	---	215	---	206	---	199	257	---
TOTAL	37,830	24,431	27,515	28,268	17,776	11,146	6,309	6,409	6,251	6,128	6,326	7,853
MEAN	1,220	814	888	912	613	360	210	207	208	198	204	262
MAX	5,350	1,930	1,270	1,270	819	711	218	210	223	208	268	330
MIN	214	189	272	272	315	215	203	206	206	185	196	216
AC-FT	75,040	48,460	54,580	56,070	35,260	22,110	12,510	12,710	12,400	12,150	12,550	15,580
MEAN†	1,333	929	768	949	621	467	321	215	201	90	155	268
CFSM†	32.28	22.49	18.60	22.98	15.04	11.31	7.77	5.21	4.87	2.18	3.75	6.49
IN.†	37.21	25.10	21.45	26.50	16.22	13.04	8.67	6.01	5.43	2.52	4.32	7.25
AC-FT†	81,960	55,290	47,250	58,380	35,720	28,720	19,090	13,240	11,960	5,550	9,520	15,960
CAL YR	2003	TOTAL 214,945	MEAN 589	MAX 5,350	MIN 189	AC-FT 426,300	MEAN† 592	CFSM† 14.33	IN.† 194.67	AC-FT† 428,800		
WTR YR	2004	TOTAL 186,242	MEAN 509	MAX 5,350	MIN 185	AC-FT 369,400	MEAN† 527	CFSM† 12.76	IN.† 173.70	AC-FT† 382,600		

† Adjusted for change in contents in Wynoochee Lake.
e Estimated

12036000 WYNOOCHEE RIVER ABOVE SAVE CREEK, NEAR ABERDEEN, WA

LOCATION.--Lat 47°17'57", long 123°39'07", in NE ¼ NE ¼ sec.23, T.21 N., R.8 W., Grays Harbor County, Hydrologic Unit 17100104, on right bank 0.8 mi upstream from Save Creek, 2.5 mi downstream from Oxbow Dam Site, 11.0 mi downstream from Wynoochee Dam, 23.5 mi northeast of city hall in Aberdeen, and at mile 40.6.

DRAINAGE AREA.--74.1 mi².

PERIOD OF RECORD.--May 1925 to current year. Published as "at Oxbow, near Aberdeen" (12035500) 1925-52, where drainage area was 70.7 mi². Records published for both sites October 1951 to October 1952.

REVISED RECORDS.--WSP 1346: 1952. WSP 1736: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 401 ft above NGVD of 1929 (stadia traverse). Prior to Nov. 7, 1925, nonrecording gage at site 2.3 mi upstream at different datum. Nov. 7, 1925, to Sept. 3, 1947, water-stage recorder at site 1.5 mi upstream at datum 444.0 ft above NGVD of 1929 (levels by City of Aberdeen). Sept. 4, 1947, to Oct. 13, 1952, water-stage recorder at site 2.5 mi upstream at datum about 91 ft higher. Oct. 5, 1951, to Sept. 30, 1976, water-stage recorder on left bank at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Since August 1972, flow regulated by Wynoochee Lake (station 12035380) for flood control, during summer months to augment the natural river flow, and for the water supply for the City of Aberdeen. Some regulation from August 1969 to September 1972 due to dam construction. No diversions upstream from station. Tacoma Public Utilities satellite telemeter at station.

AVERAGE DISCHARGE.--79 years (water years 1926-2004), 835 ft³/s, 153.03 in/yr, 605,000 acre-ft/yr, adjusted for storage in Wynoochee Lake since October 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,600 ft³/s Dec. 9, 1956, gage height, 16.95 ft, from rating curve extended above 9,000 ft³/s; minimum discharge, 57 ft³/s Sept. 3-5, 1972, gage height, 4.43 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,970 ft³/s, Oct. 20, gage height, 11.07 ft; minimum discharge, 219 ft³/s, Aug. 4, 5, 6, gage height, 4.61 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	290	1,490	1,870	550	1,470	599	473	337	328	281	226	347
2	288	1,460	1,890	529	1,430	726	453	335	315	275	224	342
3	297	706	1,950	513	1,370	950	440	332	306	257	225	319
4	316	588	1,780	493	1,330	961	424	328	299	251	223	336
5	319	577	1,950	858	1,250	1,090	412	325	313	253	219	337
6	336	571	2,320	1,460	1,330	869	402	318	372	250	298	337
7	344	503	2,000	1,540	1,290	1,210	391	319	358	253	369	336
8	400	388	1,830	2,070	1,210	1,100	382	315	340	257	265	338
9	376	379	1,730	1,870	1,160	774	373	311	329	256	248	340
10	356	421	1,670	1,840	1,130	684	366	309	320	260	241	374
11	331	518	1,640	1,540	995	636	362	304	313	256	237	713
12	697	438	1,720	1,640	804	598	356	303	312	255	232	447
13	502	445	1,700	2,000	791	573	357	299	432	255	229	488
14	374	517	1,740	2,400	922	559	375	297	372	256	229	492
15	390	573	1,610	2,380	1,310	540	374	294	348	256	229	652
16	2,480	1,000	1,710	2,000	1,190	526	361	293	337	250	228	615
17	3,830	1,710	1,660	1,810	1,110	515	353	293	332	237	227	649
18	6,220	4,000	1,350	1,840	1,280	539	353	291	358	234	225	598
19	4,800	3,720	875	1,910	1,090	527	380	286	346	238	224	526
20	5,940	2,100	872	1,640	976	424	474	283	345	237	225	456
21	5,990	1,830	850	1,230	910	410	541	283	340	233	239	412
22	7,160	1,700	799	1,010	861	404	453	288	302	231	239	386
23	2,570	2,040	780	1,030	830	403	415	284	298	229	232	365
24	1,840	2,070	989	995	841	473	387	280	293	229	254	372
25	1,710	1,900	1,080	962	862	634	371	279	291	229	495	364
26	1,640	1,830	973	1,370	859	959	359	285	287	229	547	354
27	1,600	1,730	1,050	1,780	864	1,040	352	328	286	229	383	361
28	1,580	3,480	1,000	1,970	647	852	345	327	282	228	342	410
29	1,550	2,820	874	2,200	628	763	343	319	281	227	359	429
30	1,520	2,530	589	2,520	---	576	341	372	281	229	344	424
31	1,500	---	571	1,690	---	511	---	344	---	228	339	---
TOTAL	57,546	44,034	43,422	47,640	30,740	21,425	11,768	9,561	9,716	7,588	8,596	12,919
MEAN	1,856	1,468	1,401	1,537	1,060	691	392	308	324	245	277	431
MAX	7,160	4,000	2,320	2,520	1,470	1,210	541	372	432	281	547	713
MIN	288	379	571	493	628	403	341	279	281	227	219	319
AC-FT	114,100	87,340	86,130	94,490	60,970	42,500	23,340	18,960	19,270	15,050	17,050	25,620
MEAN†	1,967	1,583	1,281	1,574	1,068	799	503	317	317	137	228	437
CFSM†	26.55	21.36	17.29	21.24	14.41	10.78	6.79	4.28	4.28	1.85	3.08	5.90
IN.†	30.62	23.83	19.94	24.49	15.54	12.43	7.57	4.93	4.76	2.14	3.55	6.58
AC-FT†	121,000	94,170	78,800	96,800	61,430	49,120	29,920	19,490	18,830	8,450	14,020	26,000

CAL YR 2003 TOTAL 352,420 MEAN 966 MAX 7,620 MIN 220 AC-FT 699,000 MEAN† 969 CFSM† 13.08 IN.† 177.51 AC-FT† 701,500
WTR YR 2004 TOTAL 304,955 MEAN 833 MAX 7,160 MIN 219 AC-FT 604,900 MEAN† 852 CFSM† 11.50 IN.† 156.40 AC-FT† 618,100

† Adjusted for change in contents in Wynoochee Lake.

12037400 WYNOOCHEE RIVER ABOVE BLACK CREEK, NEAR MONTESANO, WA

LOCATION.--Lat 47°00'42", long 123°39'15", in SE¹/₄SE¹/₄, sec.27, T.18 N., R.8 W., Grays Harbor County, Hydrologic Unit 17100104, on left bank 2,000 ft upstream from Black Creek, 3.5 mi northwest of Montesano, and at mile 5.9.

DRAINAGE AREA.--155 mi².

PERIOD OF RECORD.--October 1956 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 40 ft above NGVD of 1929, from topographic map.

REMARKS.--Records good. City of Aberdeen diverted about 98 ft³/s for municipal supply at intake 2.2 mi upstream. Other small diversions for irrigation and domestic use. Since August 1972, flow regulated by Wynoochee Dam, 45.7 mi upstream, for flood control, during summer months to augment the natural river flow, and for the water supply for the City of Aberdeen. Some regulation from 1969 to August 1972 due to dam construction. Sediment records October 1961 to June 1965. Water temperatures October 1969 to September 1986. Tacoma Public Utilities satellite telemeter at station.

AVERAGE DISCHARGE.--16 years (water years 1957-72), 1,316 ft³/s, 953,600 acre-ft/yr, unregulated. 32 years (water years 1973-2004), 1,261 ft³/s, 913,400 acre-ft/yr, regulated.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,600 ft³/s, Mar. 19, 1997, gage height, 20.21 ft; maximum gage height, 20.54 ft, Dec. 10, 1956; minimum discharge, 3.0 ft³/s, part or all of each day Aug. 26-30, 1967, gage height, 2.86 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,400 ft³/s, Oct. 20, 21, gage height, 15.87 ft; minimum discharge, 155 ft³/s, Aug. 5, 6, gage height, 2.76 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	206	1,660	3,400	971	3,220	979	832	382	383	241	160	275
2	206	1,660	2,870	889	2,920	915	759	373	354	240	159	291
3	190	1,270	3,060	811	2,620	1,200	709	363	329	240	162	269
4	203	770	2,690	741	2,340	1,290	686	358	310	222	165	256
5	215	706	2,880	700	2,080	1,560	664	349	313	216	159	265
6	229	664	4,320	1,510	2,060	1,690	624	338	388	212	188	262
7	287	640	3,730	1,890	2,020	1,980	587	334	471	209	312	262
8	290	513	3,120	2,760	1,820	2,330	550	336	421	208	256	261
9	350	435	2,730	3,080	1,700	1,760	514	321	390	208	204	280
10	331	426	2,500	3,120	1,590	1,370	482	307	372	209	183	272
11	304	597	2,340	2,850	1,500	1,190	458	302	353	209	176	677
12	476	546	2,530	2,420	1,210	1,060	437	298	338	206	171	547
13	649	488	2,510	2,750	1,110	954	423	294	451	202	168	504
14	435	520	2,570	3,040	1,330	887	442	287	471	201	165	583
15	353	587	2,570	3,630	1,920	826	485	283	417	200	165	825
16	2,250	1,030	2,390	3,080	2,130	775	457	278	383	200	162	859
17	5,430	2,190	2,590	2,640	2,060	739	438	274	359	191	161	965
18	6,560	8,490	2,220	2,560	2,210	765	415	267	349	180	162	955
19	6,150	8,440	1,640	2,630	2,070	771	430	263	366	177	160	892
20	9,800	4,810	1,460	2,490	1,770	706	528	261	346	181	160	758
21	12,100	3,390	1,370	1,960	1,560	664	658	258	336	175	172	643
22	8,970	2,790	1,250	1,630	1,410	624	650	265	319	172	210	552
23	5,050	e2,500	1,170	1,630	1,290	595	582	284	290	169	185	513
24	2,880	e3,000	1,350	1,560	1,240	666	532	260	281	166	193	469
25	2,430	3,230	1,840	1,480	1,310	787	490	251	275	164	367	451
26	2,170	3,180	1,640	1,620	1,310	1,410	460	274	264	162	708	426
27	2,010	2,770	1,690	2,450	1,300	1,960	435	335	255	162	481	406
28	1,970	5,270	1,680	3,140	1,180	1,580	423	435	250	163	355	413
29	1,890	7,960	1,560	4,250	1,040	1,330	407	367	245	162	314	443
30	1,770	4,560	1,210	5,890	---	1,160	395	405	241	161	301	448
31	1,710	---	1,070	3,970	---	938	---	424	---	160	281	---
TOTAL	77,864	75,092	69,950	74,142	51,320	35,461	15,952	9,826	10,320	5,968	7,165	15,022
MEAN	2,512	2,503	2,256	2,392	1,770	1,144	532	317	344	193	231	501
MAX	12,100	8,490	4,320	5,890	3,220	2,330	832	435	471	241	708	965
MIN	190	426	1,070	700	1,040	595	395	251	241	160	159	256
AC-FT	154,400	148,900	138,700	147,100	101,800	70,340	31,640	19,490	20,470	11,840	14,210	29,800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 2004, BY WATER YEAR (WY)

MEAN	844	2,237	2,763	2,415	2,218	1,613	967	674	517	339	235	362
MAX	2,967	4,951	5,122	4,444	4,623	4,180	1,791	1,322	1,208	766	456	1,287
(WY)	(1976)	(1991)	(1995)	(1997)	(1999)	(1997)	(1974)	(1984)	(2000)	(1974)	(2001)	(1978)
MIN	143	294	788	602	579	539	497	317	245	183	151	148
(WY)	(1988)	(1994)	(1986)	(1985)	(1993)	(1992)	(1973)	(2004)	(1979)	(1995)	(2003)	(1993)

12037400 WYNOOCHEE RIVER ABOVE BLACK CREEK, NEAR MONTESANO, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1973 - 2004	
ANNUAL TOTAL	520,500		448,082		1,261	
ANNUAL MEAN	1,426		1,224		1,907	1997
HIGHEST ANNUAL MEAN					749	1977
LOWEST ANNUAL MEAN					23,700	Mar 19, 1997
HIGHEST DAILY MEAN	12,100	Oct 21	12,100	Oct 21	119	Oct 10, 1992
LOWEST DAILY MEAN	126	Sep 3	159	Aug 2	108	Sep 22, 1992
ANNUAL SEVEN-DAY MINIMUM	132	Aug 29	161	Jul 30	119	
ANNUAL RUNOFF (AC-FT)	1,032,000		888,800		913,400	
10 PERCENT EXCEEDS	3,390		2,860		2,970	
50 PERCENT EXCEEDS	683		567		636	
90 PERCENT EXCEEDS	164		198		197	

e Estimated

HUMPTULIPS RIVER BASIN

12039005 HUMPTULIPS RIVER BELOW HIGHWAY 101, NEAR HUMPTULIPS, WA

LOCATION.--Lat 47°13'54", long 123°58'22", in SE $\frac{1}{4}$ SW $\frac{1}{4}$, sec.7, T.22 N., R.10 W., Grays Harbor County, Hydrologic Unit 17100105, on right bank at site of former bridge 0.6 mi downstream of Highway 101, 0.5 mi west of Humptulips, and at mile 22.9.

DRAINAGE AREA.--132 mi².

PERIOD OF RECORD.--May 1933 to January 1935, July 1942 to September 1979, and July 2002 to current year. Published as "Humptulips River near Humptulips" (12039000) May 1933 to January 1935 and July 1942 to September 1979.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 90.00 ft above NGVD of 1929. May 1933, Jan. 1935, and July 1942 to Sept. 1979, at site 1.0 mi upstream at different datum.

REMARKS.--Records good except for flow above 5,000 ft³/s, which are poor. No regulation or diversion upstream of station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--40 years (water years 1934, 1943-79, 2004), 1,340 ft³/s, 137.41 in/yr, 970,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,000 ft³/s, Jan. 22, 1935, gage height, 12.7 ft, datum then in use, from floodmarks, from rating curve extended above 16,500 ft³/s; maximum gage height, 23.40 ft, Oct. 21, 2003; minimum discharge observed, 82 ft³/s, Sept. 11, 1944.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 30,500 ft³/s, Oct. 21, gage height, 23.40 ft; minimum discharge, 102 ft³/s, Oct. 5, 6.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	107	831	2,880	1,060	3,220	948	1,100	433	563	262	154	315
2	106	795	2,550	958	2,860	863	947	420	485	259	152	327
3	106	699	3,300	892	2,490	874	864	406	424	263	158	288
4	105	630	2,270	826	2,240	1,020	801	403	384	247	160	267
5	104	588	2,590	771	1,860	1,590	745	394	408	240	152	252
6	117	554	4,690	780	2,020	1,690	694	370	718	236	255	240
7	205	528	3,340	1,390	2,030	3,310	655	360	817	232	912	230
8	228	505	2,550	4,050	1,700	3,280	618	360	650	224	419	227
9	531	482	2,050	3,810	1,480	2,220	584	351	561	220	293	273
10	591	515	1,760	4,290	1,320	1,710	557	341	512	218	243	258
11	410	1,780	1,570	3,260	1,180	1,430	539	328	472	218	218	1,860
12	1,870	1,080	1,920	2,580	1,080	1,240	523	313	438	210	203	885
13	1,880	811	1,790	2,880	981	1,070	506	303	971	206	190	819
14	915	691	1,880	4,310	1,420	957	553	292	844	202	181	957
15	627	765	1,920	5,180	2,840	863	588	286	695	198	175	1,630
16	7,730	2,140	2,320	3,360	2,710	796	580	281	596	194	170	1,580
17	14,900	3,830	2,740	2,380	2,400	748	560	274	530	188	166	1,660
18	8,200	17,700	2,010	2,350	3,020	834	513	266	483	183	162	1,660
19	6,020	12,200	1,690	2,660	2,540	857	547	263	451	184	159	1,430
20	14,000	4,950	1,760	2,190	1,960	779	955	258	421	200	156	1,120
21	17,200	2,950	1,680	1,780	1,640	717	1,260	254	392	189	170	875
22	5,840	2,140	1,430	1,540	1,420	681	981	266	371	180	260	765
23	4,250	1,920	1,300	1,620	1,250	663	807	275	353	175	209	687
24	2,870	2,270	1,980	1,550	1,200	985	702	261	339	170	210	606
25	2,220	2,980	2,460	1,420	1,380	1,840	626	248	327	166	1,100	549
26	1,770	2,760	1,910	1,580	1,270	2,710	576	295	313	164	1,870	503
27	1,470	2,150	1,750	2,180	1,240	2,650	545	424	298	162	914	466
28	1,420	11,600	1,600	4,130	1,170	1,960	517	621	288	160	598	438
29	1,270	11,400	1,420	5,570	1,060	1,580	481	501	278	158	467	412
30	1,060	4,320	1,250	8,940	---	1,510	452	765	268	157	390	391
31	923	---	1,170	4,580	---	1,310	---	698	---	155	343	---
TOTAL	99,045	96,564	65,530	84,867	52,981	43,685	20,376	11,310	14,650	6,220	11,209	21,970
MEAN	3,195	3,219	2,114	2,738	1,827	1,409	679	365	488	201	362	732
MAX	17,200	17,700	4,690	8,940	3,220	3,310	1,260	765	971	263	1,870	1,860
MIN	104	482	1,170	771	981	663	452	248	268	155	152	227
AC-FT	196,500	191,500	130,000	168,300	105,100	86,650	40,420	22,430	29,060	12,340	22,230	43,580
CFSM	24.1	24.3	16.0	20.7	13.8	10.6	5.13	2.75	3.69	1.51	2.73	5.53
IN.	27.81	27.11	18.40	23.83	14.88	12.27	5.72	3.18	4.11	1.75	3.15	6.17

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 2004, BY WATER YEAR (WY)

MEAN	1,096	2,109	2,729	2,588	2,274	1,852	1,298	811	470	320	244	410
MAX	3,195	3,462	5,646	5,750	4,799	3,814	2,257	1,731	895	751	552	1,250
(WY)	(2004)	(1955)	(1934)	(1953)	(1961)	(1972)	(1959)	(1948)	(1956)	(1974)	(1964)	(1978)
MIN	123	599	1,230	614	950	830	617	365	208	151	108	134
(WY)	(2003)	(1953)	(1945)	(1949)	(1956)	(1947)	(1973)	(2004)	(2003)	(1958)	(1951)	(1965)

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SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1933 - 2004	
ANNUAL TOTAL	615,258		528,407			
ANNUAL MEAN	1,686		1,444		1,340	
HIGHEST ANNUAL MEAN					1,878	
LOWEST ANNUAL MEAN					868	
HIGHEST DAILY MEAN	17,700	Nov 18	17,700	Nov 18	23,200	Jan 19, 1968
LOWEST DAILY MEAN	97	Sep 5	104	Oct 5	82	Sep 11, 1944
ANNUAL SEVEN-DAY MINIMUM	99	Aug 31	121	Oct 1	86	Sep 6, 1944
ANNUAL RUNOFF (AC-FT)	1,220,000		1,048,000		970,700	
ANNUAL RUNOFF (CFSM)	12.7		10.9		10.1	
ANNUAL RUNOFF (INCHES)	172.75		148.36		137.41	
10 PERCENT EXCEEDS	3,660		2,880		3,080	
50 PERCENT EXCEEDS	778		768		788	
90 PERCENT EXCEEDS	118		199		183	